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American Perfumer

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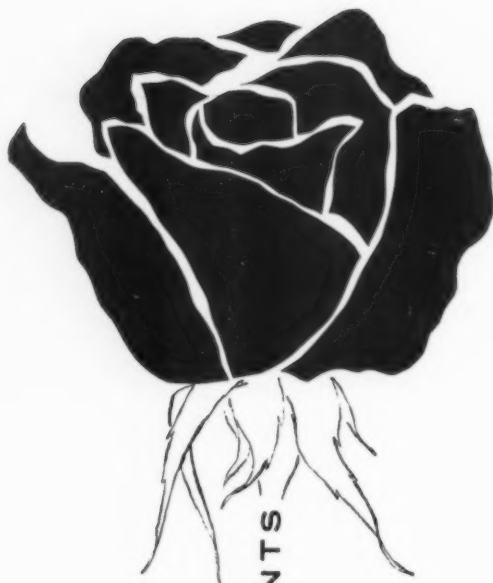
Russia will be a new competitor in the perfume industry this year when she markets three perfumes world-wide
... page 31

Growing responsibility to warn allergic customers
... page 41

There have been many advances recently in technology of white mineral oils
... page 23



Research worker uses UV spectrophotometer to determine absorbance of white mineral oil. Story on 23.



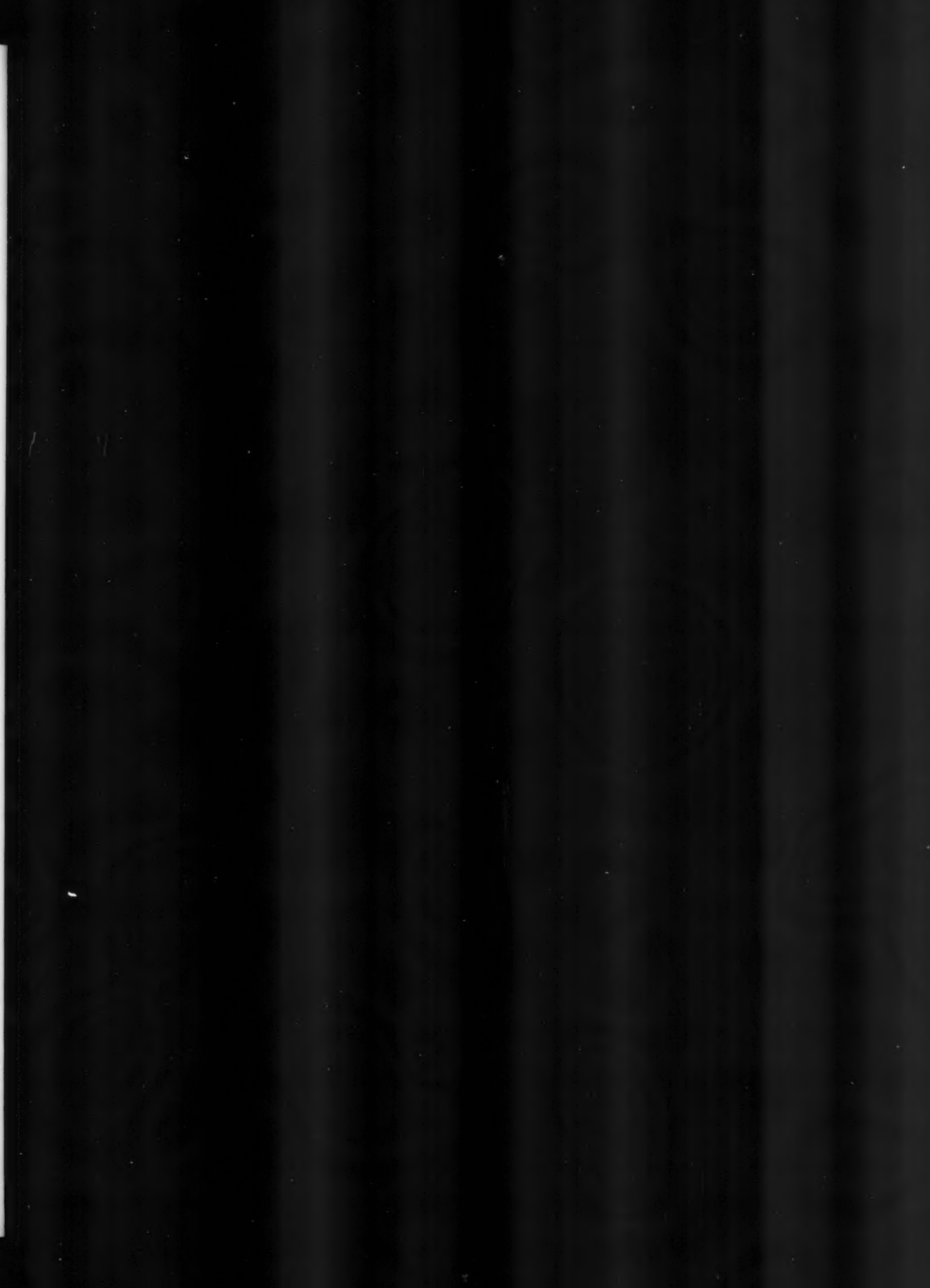
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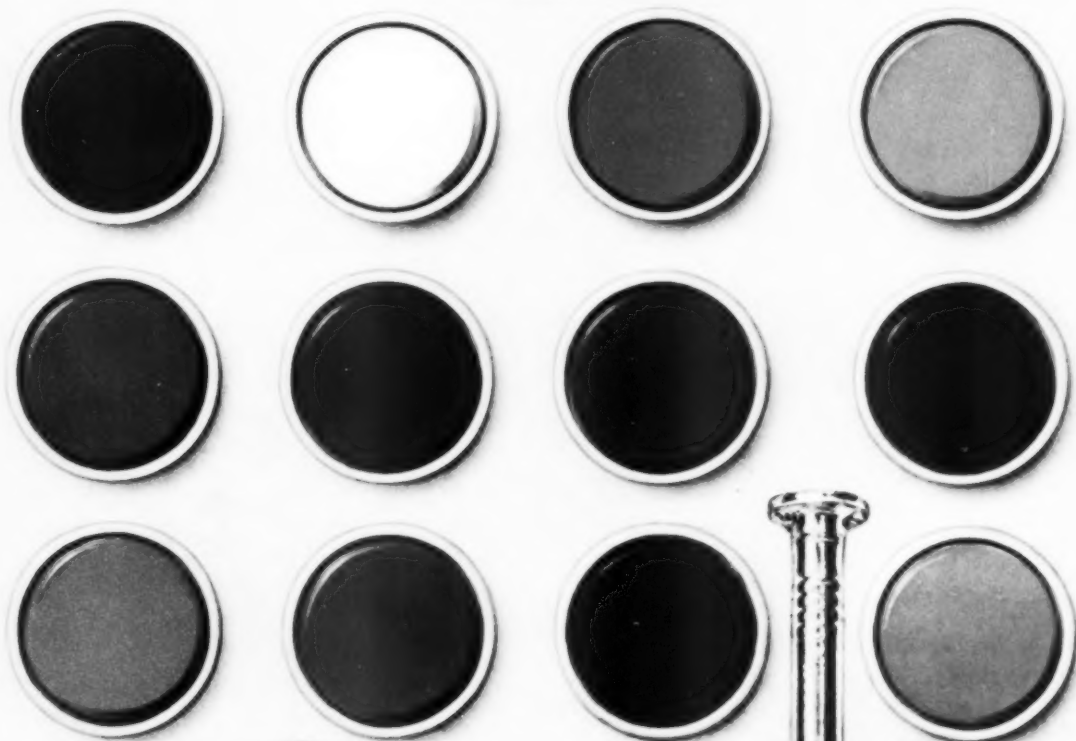
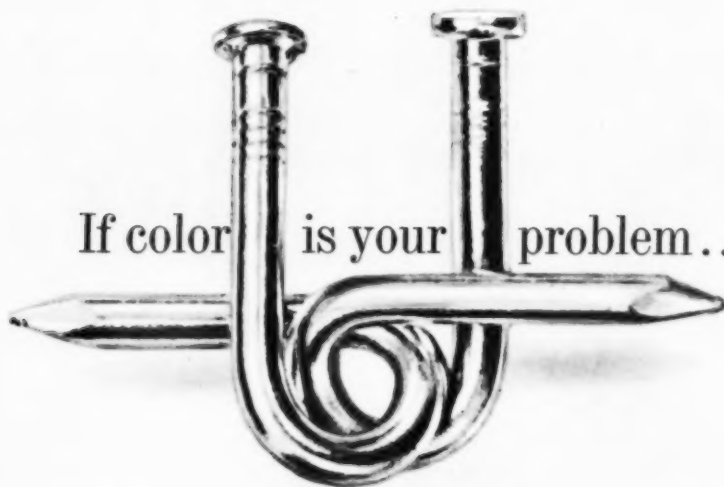
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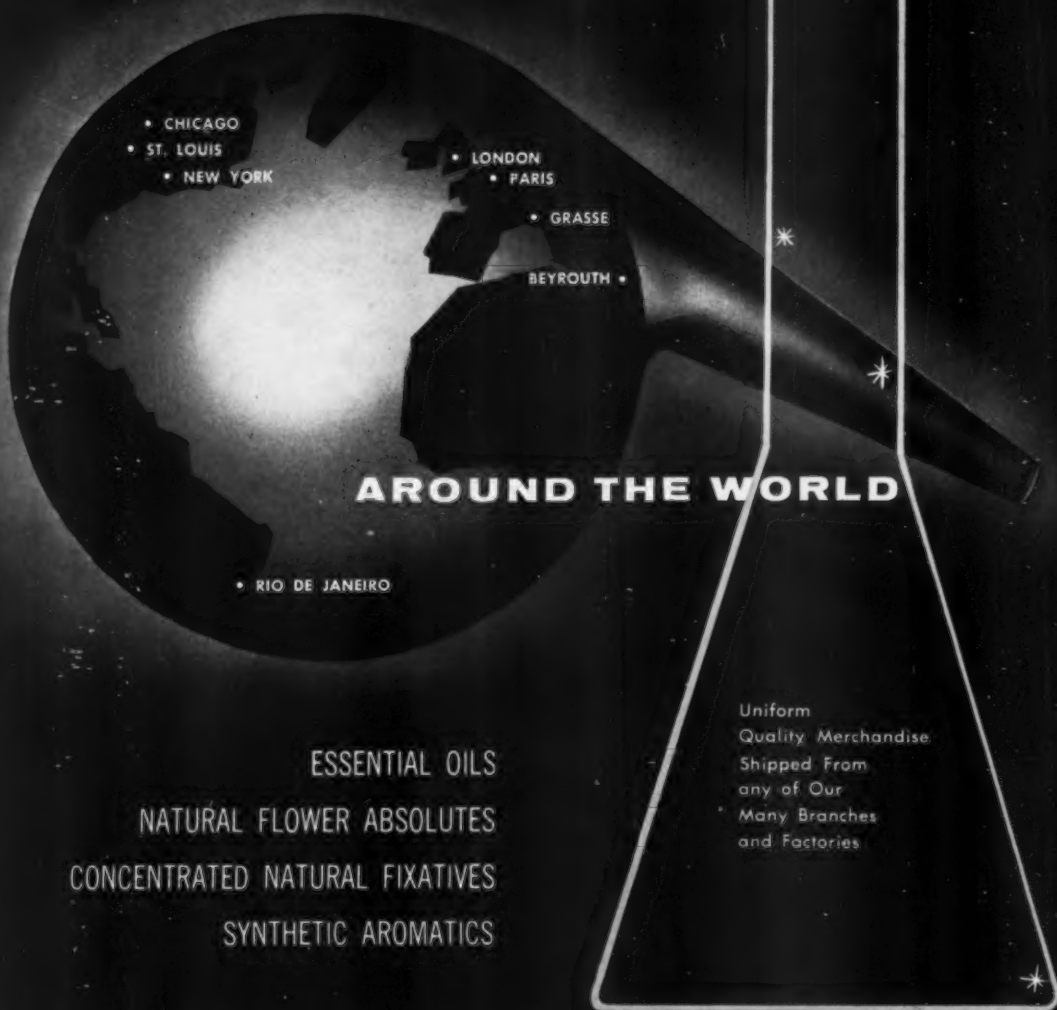
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American Perfumer

VOL. 76, NO. 2

February, 1961

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Contenido
Inhalt

Recent Technological Developments in White Mineral Oils Arthur J. Franks 23

Article covers highly refined products which are suitable for use in cosmetics and pharmaceuticals. Demand for unquestionable safety and purity in products applied to skin and hair should lead to elimination of inferior grades of technical white oils.

Récents développements technologiques des huiles minérales blanches

Cet article se réfère sur les produits très raffinés que l'on emploie dans les cosmétiques et les produits pharmaceutiques. Il y est demandé une pureté et une sûreté indiscutables des produits qui sont employés pour la peau et pour les cheveux afin que soit éliminé les huiles blanches techniques de deuxième ordre.

"Adelantos tecnológicos recientes en aceites minerales blancos"

Este artículo abarca productos sumamente refinados, adecuados para usar en cosméticos y productos farmacéuticos. La demanda por una seguridad y pureza indiscutibles en productos aplicables a la piel y a la cabellera debería conducir a la eliminación de calidades inferiores de aceites blancos técnicos.

Neuere technologische Entwicklungen bei weissen Mineralölen

Der Artikel behandelt stark raffinierte Produkte, die zur Verwendung in kosmetischen und pharmazeutischen Erzeugnissen geeignet sind. Die Forderung auf absolute Sicherheit und Reinheit der Produkte, die mit der Haut und den Haaren in Berührung kommen, sollte zur Ausmerzung von minderwertigen, technischen, weissen Ölen führen.

How Vapors of Aromatic Chemicals Affect Bacteria Jasper C. Maruzzella, Michalyn M. Garofalo, and Joseph S. Chiamonte 35

Investigation deals with the preliminary screening of a variety of aromatic chemical vapors at full strength against Gram positive and Gram negative bacteria in vitro. The vapors of 192 aromatic chemicals were investigated, and the most vulnerable bacterium was determined.

De quelle manière les vapeurs chimiques aromatiques affectent les bactéries

Les recherches traitent sur la protection préliminaire des vapeurs chimiques aromatiques, à pleine puissance, contre des bactéries, en tubes d'essai, qui prennent ou qui ne prennent pas. Des recherches ont été faites sur 192 vapeurs chimiques aromatiques et la bactérie la plus vulnérable a été déterminée.

"Cómo los gases de productos químicos aromáticos afectan a las bacterias"

La investigación comprende la filtración preliminar de gases químicos aromáticos en su potencia plena contra bacterias Gram positivas y Gram negativas in vitro. Se investigaron los gases de 192 productos químicos aromáticos, y se determinó cuales eran las bacterias más vulnerables.

Wie Gase aromatischer Chemikalien auf Bakterien einwirken

Bei den Untersuchungen handelt es sich um den vorbereitenden Schutz aromatischer, chemischer Dämpfe in voller Stärke gegen Gramm positive und Gramm negative Bakterien in vitro. Dämpfe von 192 aromatischen Chemikalien wurden untersucht und die empfindlichste Bakterie wurde bestimmt.



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Production of Essential Oils and Synthetic Scents in Russia Today Peter W. Sherwood 31

There'll be new competition for perfume producers from Russia this year. Production of synthetic raw materials is on the upswing in the Soviet Union; has grown some 13% annually during 1951 to 1958.

Production des huiles essentielles et des parfums synthétiques en Russie aujourd'hui

Cette année la Russie sera un nouveau concurrent pour les producteurs de parfum. La production de matières brutes synthétiques augmente en Union Soviétique; l'augmentation de cette production a été de 13%, annuellement, entre 1951 et 1958.

"Producción de aceites esenciales y aromas sintéticos en la Rusia de hoy"

Tendremos nueva competencia para los productores de perfumes este año, de Rusia. En la Unión Soviética, surge vigorosamente la producción de materias primas sintéticas; se ha observado un crecimiento del 13% anualmente, entre 1951 y 1958.

Herstellung ätherischer Öle und synthetischer Geruchsstoffe gegenwärtig in Russland

Neue Konkurrenz für die Hersteller von Parfum wird in diesem Jahr aus Russland kommen. In der Sowjet Union ist die Produktion synthetischer Rohmaterialien im Anstieg begriffen; zwischen 1951 und 1958 ist sie um etwa 13% jährlich gestiegen.

The Duty to Warn the Allergic Consumer Frank J. Chut 41

Many cases from the courts are cited and the conclusion is: the well-established tort concept of foreseeability is the only practical solution.

Le devoir prévenir le consommateur allergique

On cite plusieurs cas qui ont été présentés devant les tribunaux, et l'auteur conclut: la seule solution pratique est de prévoir à tout préjudice qui pourrait survenir.

"El deber de advertir al consumidor alérgico"

Se citan muchos litigios judiciales. El autor concluye: "El concepto bien establecido de la previsión es la única solución práctica."

Die Pflicht, allergische Kunden zu warnen

Viele Fälle aus der Gerichtspraxis werden angeführt. Der Verfasser kommt zu dem Schluss: Der bereits feststehende gesetzliche Begriff des vorauszusehenden Schadens ist die einzige praktische Lösung.

Hair Preparations Head Canadian Sales; Dentifrices Are Second, 95% of Firms Report 45

Les préparations capillaires sont à la tête des ventes au Canada; les dentifrices viennent en seconde position, selon les rapports obtenus par 95% des compagnies

"A la cabeza de las ventas canadienses están los preparados para la cabellera; en segundo lugar están los dentífricos, según reporta el 95% de las firmas"

Haarpflege-Artikel stehen an der Spitze der Umsätze in Kanada, Zahnpflegemittel kommen an zweiter Stelle, wie von 95% der Firmen berichtet wird

A Warburg Flask for Respiration Studies with Tissue Suspended in Oxygen Mervyn J. Huston 46

Apparatus is described, and method proposed, for *in vitro* studies of tissue. The tissue is in contact with the gas and does not obtain oxygen from solution in a liquid medium.

Etudes sur le flacon Warburg pour la respiration avec tissus suspendus dans l'oxygène

L'appareil y est décrit, et la méthode proposée, pour faire des études, en tubes d'essai sur le tissu. Le tissu est en contact avec le gaz et ne reçoit pas d'oxygène de la solution à l'état liquide.

"Una redoma Warburg para estudios respiratorios con tejidos suspendidos en oxígeno"

Se describen aparatos y el método propuesto para efectuar estudios de tejidos *in vitro*. El tejido está en contacto con el gas y no obtiene oxígeno de la solución en un medio líquido.

Eine Warburg-Flasche für Atmungs-Untersuchungen mit in Sauerstoff suspendiertem Gewebe

Der Apparat zur *in vitro* Gewebe-Untersuchung wird beschrieben und eine Methode dafür vorgeschlagen. Das Gewebe steht mit dem Gas in Berührung und erhält keinen Sauerstoff bei Auflösung in einem flüssigen Stoff.

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Check List of Best Selling Technical Books

COSMETICS, SCIENCE AND TECHNOLOGY. The editorial board of this encyclopedia cosmetic work is made up of H. D. Coulden, E. G. Klarmann, and Edward Sagarin, executive editor. It is in five parts: I, Scope of Cosmetics (80 pages); II, Toilet Preparations (812 pages containing 800 formulas); III, Manufacture and Technology (214 pages); IV, Physiological Considerations (92 pages); plus preface and complete index. The sixty-five experts who contributed, are a "who's who" of cosmetic chemists in the United States and Canada. 1433 pages. Illustrated. Price \$27.50.

HENLEY'S 20TH CENTURY BOOK OF FORMULAS, PROCESSES, TRADE SECRETS—REVISED, ENLARGED EDITION. Manufacturers, chemists and others call HENLEY'S the most valuable book of its kind. Nearly 10,000 formulas, processes, trade secrets. It contains formulas for nearly everything imaginable; new ways of doing things; technical process; so-called trade secrets. It has helped thousands make more from their present business and professions. A single formula may be worth more than 100 times the price of the book. Over 900 pages, completely indexed, cloth binding, \$5.25 postpaid.

PRESSURIZED PACKAGING (AEROSOLS). By Alfred Herzka, Jack Pickthall. Although technical problems occur with all types of packages, those which arise with pressurized packages are many and complex. This reference book, by two recognized authorities deals with propellants, containers, valves, filling methods, laboratory procedures, emulsified systems, and perfumes. There is a complete section containing more than 200 formulations, including foods, insecticides, cosmetics, paints, and numerous other products. 400 pages. Illustrated. Price \$12.00.

PERFUMERY SYNTHETICS AND ISOLATES. By Paul A. Bedoukian. This carefully compiled volume meets the genuine need for authoritative data on perfumery synthetics. It embraces the history, chemistry, physical and chemical properties, manufacture, uses, and other pertinent data of the principal perfumery compounds; and covers the important perfumery synthetics. A complete index adds to the value of this important work. 488 pages. Price \$10.25.

THE HANDBOOK OF SOLVENTS. By Leopold Scheffan and Morris Jacobs. The most useful work of its kind today. Part I covers theoretical aspects and practical attributes such as solvent action, solvent power, evaporation and evaporation rates. In Part II the physical constants of over 2700 liquid compounds are tabulated for easy comparison. 728 pages. Illustrated. Price \$12.00.

COSMETICS—THEIR PRINCIPLES AND PRACTICES. By Ralph G. Harry, discussed the skin, its nutrition and scientific care; the hair, its proper grooming, the physio-chemical problems involved in its washing; the teeth and their care, covering the present status of different dentifrices, and the luster-producing properties of ingredients. Much of the information has its source in the research activities of its author, embracing chemistry, dermatology, and microbiology. 786 pages. Illustrated. Price \$17.25.

INTERNATIONAL ENCYCLOPEDIA OF COSMETIC MATERIAL TRADE NAMES. By Maison G. deNavarre, brings you reference data you will turn to constantly . . . the most complete listing of all the materials of the world used in cosmetic manufacture . . . including quick concise descriptions of approximately 4,000 materials . . . the names and addresses of the suppliers . . . and a very useful cross-index of the materials and their uses. You will use it when seeking new materials, or substitutes for those you may now be using. 400 pages. Price \$7.50.

HANDBOOK OF COSMETIC MATERIALS. (Their Properties, Uses, and Toxic and Dermatologic Actions). By Leon Greenburg and David Lester. Contains alphabetical listing, with frequent cross references, of information on approximately 1,000 substances. For each compound gives: formula (including collateral names), properties, toxic action, dermatological action. Exhaustive bibliography. Essential for manufacturing chemists cosmetic industry, dermatologists, allergists. 467 pages. Price \$13.50.

THE ESSENTIAL OILS. By Ernest Guenther, with the collaboration of leading experts, this monumental six-volume work includes: Vol. I, Origin and Development of Essential Oils. 427 pages. Price \$9.50. Vol. II, detailed data on several hundred constituents of essential oils. 852 pages. Price \$13.50. Vol. III, discusses the oils of the plant families Rutaceae and Labiate. 777 pages. Price \$13.50. Vol. IV, covers the widely used oils: citronella, lemongrass, bois de rose, cassia, and others. 752 pages. Price \$13.50. Vol. V, takes up other oils of special interest to flavor, perfume and soap manufacturers: rose, ginger, cardamon, anise. 507 pages. Price \$13.50. Vol. VI, completes the monographs on individual oils: wintergreen, sweet birch, juniper berries, and the numerous pine oils. 552 pages. Price \$13.50.

MANUAL FOR THE ESSENCE INDUSTRY. By Erich Walter. Comprises methods, with formulas for making all kinds of essences for liquors and alcoholic drinks, fruit juices and jams, mineral waters, essences for fruits and other vegetables, essences for confectionery and pastry. Describes raw materials and laboratory practice. Discusses taste and the transfer to foods and beverages. 427 pages. Illustrated. Price \$8.25. Published 1916.

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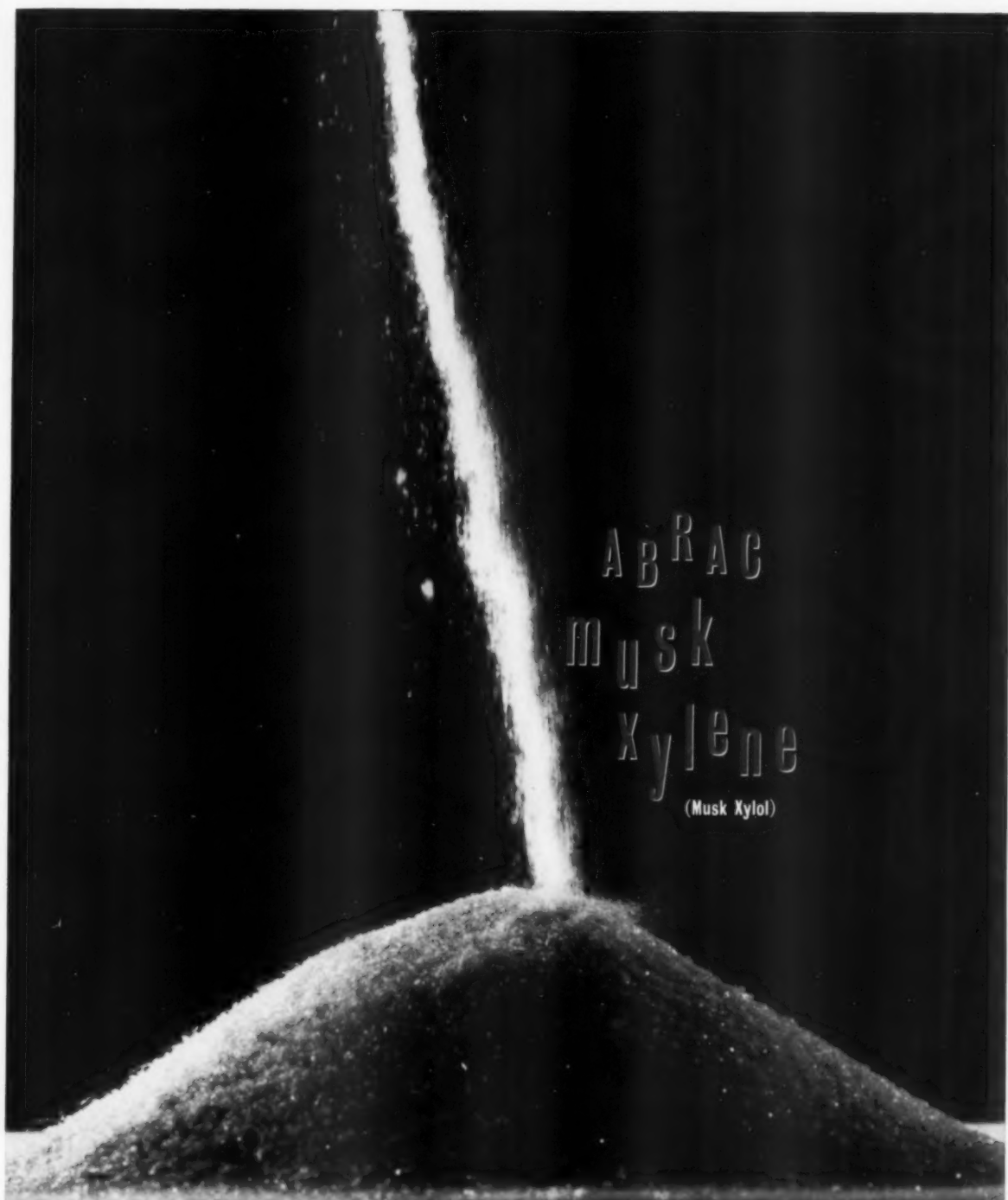
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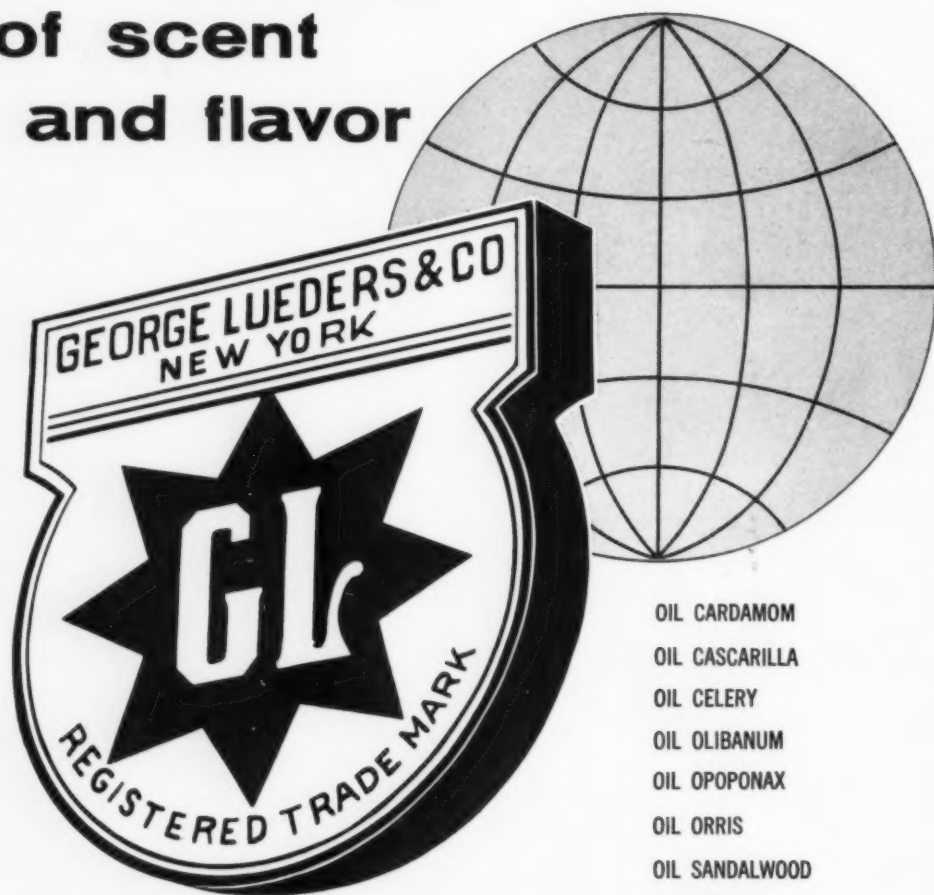
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Questions and Answers

Q. *I am a young pharmacist interested in the art of perfumery. For the past few weeks I have been converting an unused coal bin into a suitable work laboratory for my experiments. Your magazine has provided me with the names of many concerns through their advertisements which can supply me with the many necessary raw materials. However, I am uncertain as to what equipment is proper and necessary and where this may be purchased to complete a novice perfumer's work laboratory. I am also in the process of study and of collecting a reference library and would greatly appreciate a recommended book list. L. E. J., N. Y.*

Q. *As a pharmacist we think you will know the type of glass where necessary for laboratory work for experimental perfumery. It is the usual line of beakers, test tubes and Erlenmeyer flasks. If you are unable to locate a source of supply for blotters used in perfumery and the perfume companies whom you shall be contacting are unable to give you any, then we suggest that you use strips of filter paper, cut to the correct size. Quantitative paper is not necessary. Good qualitative paper is adequate. As far as books are concerned, a set of these by Poucher, PERFUMES, COSMETICS AND SOAPS will run you nearly \$40. Three new volumes have just recently come off the press. The book PERFUMES AND THEIR PRODUCTION by Maurer is an unusually good one for beginners. This will run you around \$7.00. These books can be ordered from the American Perfumer book department.*

Q. *We are interested in marketing a hair conditioner and dressing similar to the type made by Helene Curtis called "Suave." This is a hair cream and is more or less water soluble as it does wash out with plain water and is not greasy when used by either men or women. At the same time we would like to receive information regarding the names and addresses of suppliers who would be contacted to furnish the materials involved for this formula. H. D. F., Fla.*

A. We do not know the composition of the Helene Curtis product, "Suave" nor can we make an analysis of it for you. However, a solid, water soluble hair cream can be composed from the following formula:

Amerchol L-101	4.0 %
Beeswax	23.75%
Mineral Oil, 70 vis.	21.0 %
Water	50.0 %
Borax	1.25%
Perfume & Preservative	q.s.

- Procedure:**
1. Place all the oil soluble materials in one container and heat to 70°C.
 2. Heat the water containing the water soluble materials to the same temperature.
 3. Add the water solution to the oils while agitating and continue mixing until the batch is almost cool. Add the perfume and preservative; fill containers.

Best results are obtained by processing the cream through a homogenizer, colloid mill or other machine to reduce the particle size to the minimum. However, very good results are obtained with adequate agitation alone. Amerchol L-101 may be obtained from the American Cholesterol Products, Inc., Amerchol Park, Edison, N. J. The other materials listed in the formula may be purchased from Ruger Chemical Co., 62 Ninth Ave., New York 11, N. Y.

Q. *We would like to know if there are any schools where perfumery might be studied in this country. Are there any courses given at any colleges on cosmetics and/or perfumery? F. L., Ghana*

A. Columbia University, New York City, St. John's University, Brooklyn, New York, and Rutgers The State University, New Brunswick, New Jersey, have cosmetic courses. Columbia and Rutgers have taught a very basic perfumery course. Many novice perfumers apprentice in factories in Grasse, France to round out their training.

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Alcohol

What a job the U. N. could do for the toilet goods industry through its appropriate subcommittee if it were to standardize internationally:

- a. alcohol denaturants
- b. bonding requirements
- c. record keeping
- d. drawbacks on tax-paid alcohol
- e. eliminate the presence of government inspectors (for which the manufacturer pays an hourly fee and a minimum in most countries) during denaturing at the plant
- f. denature all alcohol at the distillery
- g. eliminate archaic laws and regulations that were made for the 19th century.

All this would simplify formulating products no end.

One of the more modern systems is in use in Canada, although they are still plagued by inspector's presence during denaturing with "essential oils".

Our U. S. system certainly has become quite streamlined in regard to tax-free denatured alcohol.

Here is a good example. Try to get a tax-free alcohol in the better known countries. You will be surprised where there is none. Another

example: try to get alcohol containing as a sole denaturant, only diethyl phthalate. Surprising how few countries have it. Better yet, try to get alcohol denatured with essential oils only. Not many of these either, although our neighbor, Mexico, has an alcohol containing either diethyl phthalate or citronella oil as sole denaturant.

Companies with international operations know the problems I am talking about. There is no reason why international standardization can't be done. Many exist already, so there is plenty of precedence for a general realignment.

The need for some of the horrible denaturants used in bygone years is gone and it is a shackle on the neck of the industry. Take industrial methyl alcohol. First, it stinks to high heaven; then the stuff is toxic whether applied externally or taken internally. And yet in this day of enlightenment, the United Kingdom and a number of countries of the British Commonwealth *still use such a denaturant for alcohol intended for cosmetic use.*

Why talk about helping "backward" nations? Let's look at home and see who is backward.

Notes

The graduate school of arts and sciences of St. John's University (Jamaica, N. Y.) is offering two courses in aerosol technology running for four months, granting graduate credits New York Academy of Sciences reports winters between 1851 and 1900 were colder than between 1901-1950. Present cold weather is part of a pattern comparable to the pre-1900 winters which I. I. Schell of Tufts University says were pretty rigorous. Does that mean we are in for warmer winters for the next 50 years? The A. M. A. has published a report on the incoming condition of President John F. Kennedy The A. M. A. also reports that salt from the sea is bunk. "These claims are typical of the claims made by food faddists regarding minerals in our diets".

. . . . Congratulations to the Sociedad Espanol de Quimicos Cosméticos for getting the financial cooperation of Spain's three surfactant manufacturers to publish their March 1960 symposium on "Agentes Teusoactivos" (Surface-Active Agents) The iodinated amino acid L-tri-iodothyronine so-

bers alcoholics when used by hypodermic injection Not only conception but both breast and cervical cancer can be controlled by the new steroid (17-a-ethinyl oestradiol).

. . . . Maybe with the purchase of a drum of glycerin or a pound of perfume compound you will be getting trading stamps. It's being done in the chemicals field. The fly in the ointment is who gets the stamps: the president of the company? his children? the buyer? the treasurer? or perhaps even the chemist? Sales Management for December 1960 has quite a financial roundup on 801 leading corporations. There are some interesting 10 year average returns on net worth for drug and cosmetic companies A very useful article on "The Permanent Setting of Wool" appears in the Dec. 26, 1960 issue of the American Dyestuff Reporter. All in permanent waving should read it.

On and Off

Well, FDA has relisted (Jan. 10, 1961) FD & C Red #1 as Ext. D & C Red #15 for use in all cosmetics excepting those applied to mucous membranes or the lips.

The delisting of this delightful color has raised plain hell in color matching. Furthermore the suddenness of the delisting (Nov. 26, 1960) caused manufacturers to get rid of existing stocks at once in case an FDA inspection were made and a decertified color was on the premises. The waters of the principal manufacturing areas must have had a faint pink during the month of December.

Not only is there a loss in money, but a great amount of time has been wasted by lab people in attempting to re-match colors. (Couldn't we make less haste and cause less all around waste?)

The best combination seemed to be FD & C Reds #2 and #4. But FD & C Red #4 has a shadow cast over it.

Yet it is good to know that Ext. D & C Red #15 (formerly FD & C Red #1) is safe when applied externally, although further feeding studies are going on at FDA.

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*Benzaldehyde (Benzoic Aldehyde) is a substance recognized by the Food and Drug Administration as safe for use in foods as a synthetic flavoring. (Federal Register, August 12, 1960, Vol. 25, page 7698).



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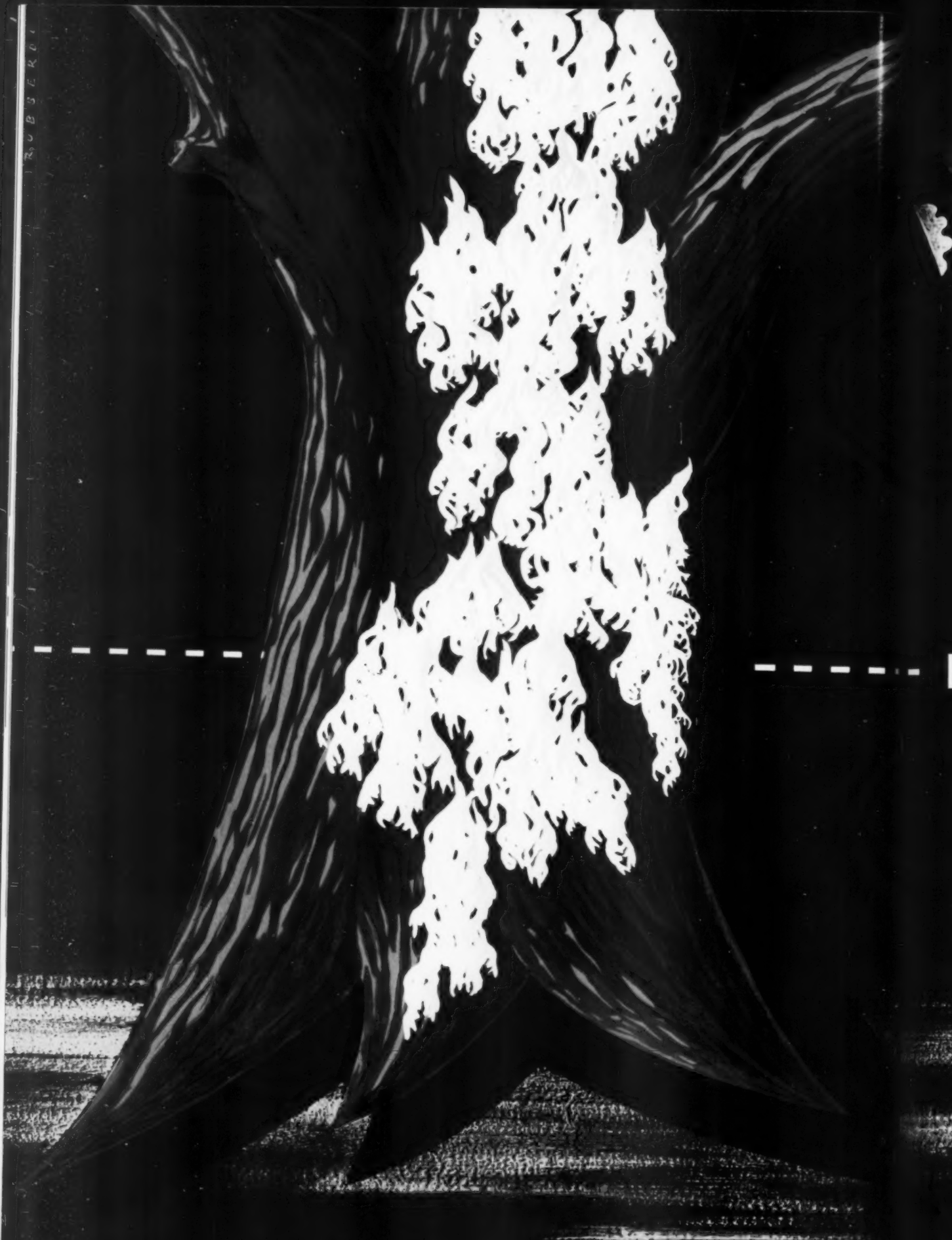
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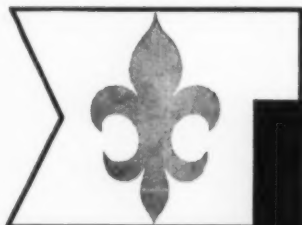
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NEW TECHNOLOGY of White Mineral Oils

BY ARTHUR J. FRANKS
Pennsylvania Refining Co.

The recent furor created by passage of the Delaney Amendment to the Federal Food, Drug and Cosmetic Act has caused manufacturers to reexamine the purity of all ingredients used in products which come under the Act and to reassure themselves of freedom from carcinogenicity, toxicity or other harmful effects. White mineral oils are so widely used in cosmetics and in certain pharmaceutical products that questions can arise concerning their composition, properties and suitability. Hence a discussion of pertinent knowledge that has become available during recent years should be of current interest to readers of this magazine. This paper will also outline briefly some fundamentals which are frequently overlooked and attempt to correct a few misconceptions that are all too common. Only those highly refined products which are suitable for use in cosmetics and pharmaceuticals will be considered here. Such oils, to be designated properly as "white mineral oils", are produced by the drastic sulfonation of selected petroleum fractions for the removal of aromatic, unsaturated and other reactive hydrocarbons, as well as minor amounts of sulfur, oxygen and nitrogen derivatives which may be present. In addition to troublesome quantities of acid sludges which must be disposed of, the sulfonation process inevitably yields varying amounts of sulfonic acids, complex sulfo-derivatives and rather small percentages of the degradation products of side reactions, all of which are soluble in the acid oil. In the usual process of commercial refining, these by-products are substantially removed from the neutralized oil by extraction with lower alcohols, followed by the removal of volatile contaminants and final filtration over a suitable adsorbent to remove remaining impurities.

Differences in properties and composition explained

This general manufacturing procedure is used by all refiners for the manufacture of N.F., U.S.P. and "technical white oils", which either are not so drastically treated as the better grades or fail in one or more respects to comply with all N.F. or U.S.P. requirements. Although the same general refining process may be employed in different refineries and the resulting white oils may appear to be quite similar in many respects, there can be significant differences in chemical and physical properties of the final products. These differences can be very important in some applications and are determined by:

1. The composition of the raw stock and the relative percentages of the various types of saturated hydrocarbons which it contains. Derivatives may also be present which, during sulfonation, can react with the sulfonating agent (usually 20 percent oleum) to produce a saturated hydrocarbon of lower molecular weight and other products. Essentially "paraffin base" stocks must be used for the manufacture of odorless and tasteless white oils of high quality when the desired viscosity is below approximately 100°. Technical and economic problems arise in the commercial

*All viscosities are expressed in Saybolt Seconds Universal at 100°F unless otherwise indicated.

manufacture of white oils from paraffin base stocks in the higher viscosity ranges. Consequently, U.S.P. grades are produced from essentially "naphthenic" stocks, most of which originate in the Gulf Coast area.

2. The extent or severity of treatment with oleum or other sulfonating agents.

3. The technique of refining. This involves control of a number of variables during processing which can affect the ultimate quality of the product. Among these are the number of sulfonations, the ratio of sulfonating agent to oil in each application, mixing technique, reaction temperatures, speed of sludge separations, number of refining cycles and many others. As in any manufacturing process, the production of superior products depends on conscientious attention to minute details and the expenditure of the necessary effort, time and money.

4. The adequacy and thoroughness of quality control of the finished products.

Recent innovations in the process of sulfonation involve the use of liquid or vapor sulfur trioxide and the development of various forms of continuous sulfonation procedure (1) which could be adapted to the refining of white oils. Regardless of the variations in refining technique, exhaustive treatment is needed to yield oils of high purity which will meet all the requirements of the N.F. or U.S.P. and satisfy the consumer today.

The specifications for N.F. and U.S.P. liquid petrolatums are well-known and need not be given here. However, it might be well to point out that U.S.P. XVI and N.F. XI, which became effective on October 1, 1960, both contain a change in the requirements for oxidation inhibitor which may be of interest to some users. Whereas the previous issues of these compendia permitted the use only of alpha tocopherol (without a label declaration) and limited the quantity to a maximum of 10 ppm, any "suitable stabilizer" may now be used. This may be interpreted as permitting the use, within established limits, of any oxidation inhibitor approved by the Food and Drug Administration for use in food products.

Influence of composition on properties

For most applications, the white mineral oils now available may be defined to a degree which assures satisfactory uniformity and avoids problems of a serious nature. In some instances, however, more knowledge of composition would prove both useful and valuable. The effect of hydrocarbon composition and structure on emulsifying characteristics is recognized, as well as the effect on viscosity, volatility, cloud and pour tests, etc. What is not known is the influence of structure on properties that are of more specific interest to cosmetic chemists and on other properties which are of great importance biologically. Regardless of the fact that the oils we have been considering are composed entirely of "saturated" hydrocarbons, their exact composition is still very complex and unknown. Although the types of hydrocarbons present are usually classed simply as "paraffins" and "naphthenes", there can be great variations in the relative percentages of these two types in different products of similar viscosity. The number of isomers in both the paraffin and naphthene series can run into thou-

sands of individual compounds. Since the more commonly used white oils are composed of hydrocarbons which contain 17 and more carbon atoms, it is apparent that most of the paraffins present will not possess a straight chain structure because those containing more than 17 carbon atoms are waxy solids at room temperature. Less than 10 percent of such waxes are likely to occur in N.F. products and less than about 5 percent in the heavier U.S.P. oils. The remaining members of the paraffin series must be branched chain isomers. Those with tertiary hydrogen atoms susceptible to attack in the latter stages of sulfonation would be eliminated during refining.

Most of the naphthenes present probably contain one or more rings of 5 or 6 carbon atoms each, some of which can be kata-condensed, with variable numbers of side chains of different lengths. Little is known about petroleum alicyclics containing more than 8 carbon atoms in the ring and it is unlikely that they are found in white mineral oils because of the tendency of the larger rings to be ruptured during the severe conditions of sulfonation. Aromatics will react with the sulfonating agent and will be absent. However, there is a possibility that aromatic nuclei with multicarbon, paraffin side chains on every available carbon atom could occur in the raw stock and pass through the process of refining without being attacked. Since such aromatics would exhibit properties essentially like those of the paraffins or naphthenes, they could properly be classified as "saturated hydrocarbons."

Gain knowledge of petroleum fractions

In spite of the insurmountable problems encountered thus far in the separation of individual hydrocarbons and the great difficulties in effecting separation of individual types, we have added considerably to our knowledge of the general composition and properties of petroleum fractions during recent years. Much of the recent literature and that since about 1925 deals with the structure and properties of hydrocarbons and fractions which boil below 250° to 300° C. A recent volume (2) edited by Brooks, Kurtz, Boord and Schmerling presents an interesting chapter on this subject. It contains information that may be utilized to throw some light on the composition of white mineral oils, as well as a good bibliography. Van Nes and Van Westen (3) have developed a procedure for computing the percentages of carbon atoms present in the various types of hydrocarbons occurring in petroleum fractions. Hirschler (4) has published an equation which may be used for computing molecular weights of a wide variety of mineral oils from viscosity data. Fenske, Hersh and their co-workers at Pennsylvania State University have made valuable contributions to our knowledge of the hydrocarbons in the lubricating fractions of petroleum, some of which could be sources of white oils. In a paper by Hersh, Fenske, Booser and Koch (5), methods are developed for estimating the average number of rings per molecule, the average number of carbon atoms occurring in rings, the average weight percent rings and the average percent carbon in the rings for mixtures of hydrocarbons containing naphthenes and paraffins (such as would occur in white oils), all

from refractive index and molecular weight data. In a valuable reference work, Ferris (6) has compiled boiling points, refractive indices, melting points and number of C and H atoms for hundreds of relatively pure hydrocarbons which have been reported prior to early 1954. Most of them were prepared synthetically and have boiling points above 250° C.

Mineral oil analysis

Perhaps the most comprehensive and useful monograph that has appeared to date is the recent work of Waterman (7) and his collaborators. He has devoted most of his professional career to researches in the field of mineral oil analysis and has presented in his book a system which may be applied to white mineral oils that have molecular weights above 200. The method is also applicable to less highly refined mineral oils which are free from olefins and oxygen and nitrogen derivatives. From data on the refractive index, density and viscosity of white oils may be computed their molecular weights, the percentages of carbon atoms which occur in naphthene rings and the number of such rings. From these computations may be estimated the percentages of paraffins and naphthenes. Although the results are based on certain assumptions and may not represent true values, they do provide information of practical value in making

comparisons and explaining differences in properties and behavior. Table I below gives Waterman composition analyses, detailed physical properties and correlation indices obtained on two light "technical" oils, five N.F. and two U.S.P. grade white mineral oils, each of which is colorless and odorless and has been highly refined to pass easily the U.S.P. acid test for carbonizable substances.

The data in Table I appear to be consistent and self-explanatory and should not require detailed discussion. It is evident that specific refraction, refractivity intercept and viscosity-gravity constant reveal smaller differences than would be found between different types of lubricating oils of similar viscosity. This is what would be expected from the comparatively simple paraffin and naphthene composition of medicinal grade oils. It is the aromatic and unsaturated hydrocarbons which have the greater influence on the indices; and these are absent from the oils referred to in Table I.

The Waterman analysis data portray some interesting property differences. The influence of paraffinicity and naphthenicity on specific gravity, refractive index, cloud test, pour test, percent carbon in naphthene rings and average number of naphthene rings,

Table I—Characteristics of Typical White Mineral Oils

Property	Technical Oils		National Formulary White Oils					U.S.P. Grades	
	I	II	I	II	III	IV	V	I	II
Viscosity at 20°C, cs, ASTM	5.4	10.5	24.2	30.4	43.5	44.1	54.6	146	237
Viscosity at 100°F, SSU, ASTM	37.7	47.6	69.6	78.5	97.2	98.2	113.7	255.2	372
Sp. Gravity at 25°C, U.S.P.	0.7990	0.8184	0.8343	0.8373	0.8483	0.8623	0.8591	0.8576	.8794
Density, d_4^{20}	0.8014	0.8209	0.8370	0.8400	0.8508	0.8649	0.8617	0.8602	.8818
Refractive Index, n_D^{20}	1.4452	1.4540	1.4628	1.4632	1.4680	1.4710	1.4721	1.4727	1.4811
Cloud Point, °F, ASTM	+25	+20	+30	+15	+15	-30	+15	+10	-5
Pour Point, °F, ASTM	+20	+15	+30	+10	+10	-35	+5	0	-20
Flash Point, °F, ASTM	265	290	360	365	370	345	375	460	435
Distillation Temperatures, °C*									
Initial B. Pt.	269	280	318	293	344	296	342	391	376
10 Percent	276	302	365	352	375	341	382	432	423
50 Percent	280	321	384	387	404	370	405	460	456
90 Percent	284	352	411	424	441	423	460	496	497
End Point	316	374	419
Specific Refraction**	0.3322	0.3299	0.3289	0.3280	0.3265	0.3231	0.3250	0.3259	0.3230
Refractory Intercept***	1.0445	1.0435	1.0445	1.0432	1.0422	1.0384	1.0401	1.0426	1.0402
Viscosity-Grav. Constant†	0.8054	0.796	0.799	0.800	0.823	0.824	0.818	0.799	0.821
Waterman Composition Analysis (7)									
Average Molecular Wt.	244	279	363	378	386	350	383	497	475
Average Mol. Formula	C _{17.5} H ₃₅	C ₂₀ H ₄₀	C ₂₆ H ₅₂	C ₂₇ H ₅₃	C ₂₈ H ₅₄	C ₂₅ H ₄₇	C _{27.5} H ₅₃	C ₃₆ H ₆₉	C ₃₄ H ₆₄
Percent Carbon in Naphthene Rings, %C _n	21.8	26.4	23.8	25.4	31.1	45.3	36.2	27.4	39.5
Average Number of Naphthene Rings, R _n	0.79	1.22	1.31	1.52	1.95	2.63	2.16	2.4	3.2

*At 10 mm. with temperatures converted to 760 mm. Used 200 ml. sample in 500 ml. flask through a 24 inch rod-packed column.

**Lorenz-Lorenz(7) p. 15 $r = \frac{n^2 - 1}{n^2 + 2} \cdot \frac{1}{d}$

***2 p. 306 $r_1 = n - \frac{d}{2}$

†2 p. 326 $VG = 100G - 1.0752 \log (V_1 - 38)$
 $10 - \log (V_1 - 38)$

is well illustrated by N.F. Oils III and IV, which have almost the same viscosities (97.2 and 98.2). The influence of differences in the paraffin-naphthene ratio on viscosity is outstanding for the two U.S.P. oils, which are roughly similar in average molecular weight. The specific gravity, refractive index, viscosity-gravity constant and pour test are also clearly affected.

From the Waterman analyses we may conclude that the composition of N.F. and U.S.P. white mineral oils will normally fall within the following ranges:

Paraffins (alkanes) 53 to 80 Percent (wt.)
Naphthenes (alicyclics) 20 to 47 " "

Although the reader should again be cautioned against use of the computed data other than for comparisons, it is believed that they do aid considerably in defining oils more specifically than was possible heretofore.

The separation of paraffins from other series of hydrocarbons by means of adduction with urea and thiourea has been discussed and evaluated by McLaughlin (2a). The procedure is rather involved, time-consuming and of limited usefulness. Separations are incomplete when applied to complex mixtures such as we are considering because experience has shown that urea can form complexes with saturated hydrocarbons other than straight-chain paraffins. The results of urea adduction* on an N.F. oil of 60 viscosity, which gave an adduct yield of 14.8 percent, are shown in Table II.

Infrared spectra were run on the original and on the two products of adduction. The latter are reproduced in Figure 1.

*Made in the Cleveland laboratories of Pennsylvania Refining Company

Determining kinematic viscosity in white mineral oil.



Table II

	Original N. F. Oil	Urea Adduct	Naphthenic Residue After Urea Adduction
Density $\frac{20}{4}$	0.8385	0.8315	0.8482
Sp. Gravity at 60°F	.8423	.8353	.8519
Refractive Index n_D^{20}	1.4618	1.4403	1.4658
Cloud Test, ASTM, °F	8	58	—34
Pour Test, ASTM, °F	10	55	—35
Aniline Point, °C	100.6	—	100.1

Apparently a marked separation was effected, even though it was probably far from complete. The infrared spectra and other properties indicate that the adduct is entirely paraffinic, although the density appears to be high. Adduction had almost no effect on the aniline point. This was not unexpected, in view of the composition of the oils and the fact that it is the aromatics, rather than naphthenes and isoparaffins, that have the greatest influence on aniline point.

Purity and its significance

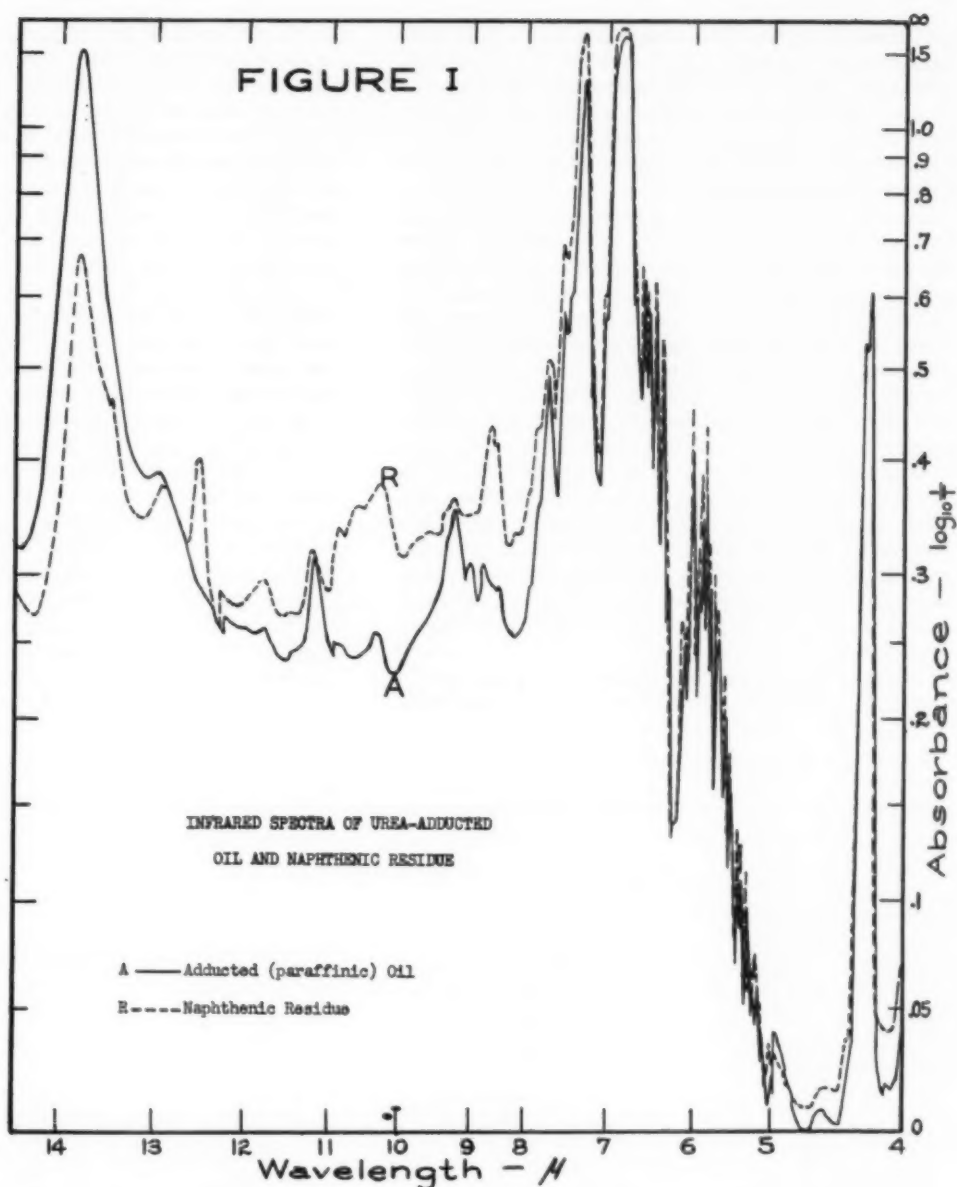
White mineral oils formerly considered to be of high quality and which comply with all N.F. or U.S.P. requirements (including the acid test) can still fail to give complete satisfaction due to the presence of small amounts of certain impurities. Such oils can fail to meet today's high standards because of:

1. Lack of stability when exposed to diffused light and direct sunlight for long periods during which objectionable odors and taste develop.
2. Lack of stability toward heat, as manifested by discoloration during prolonged heating at 120°C. or even during relatively short exposure to temperatures above 150°C.
3. Lack of stability at ordinary temperatures caused by reaction with dissolved oxygen of the air introduced during manufacture, handling and subsequent storage and use.
4. Fluorescence, even though very slight, as indicated by ultraviolet absorbances higher than those proposed by Haenni and Hall (8) as follows:

Wave length	Absorbance
275 mμ	0.3 (1 mm. cell)
295-299 mμ	0.225 (1 cm. cell)
Above 300 mμ	0.18 (1 cm. cell)

This standard of purity has been tentatively accepted as evidence of freedom from possibly harmful polynuclear aromatics by the Food and Drug Administration.

Schurmann (9) was the first to show that, contrary to prevailing opinion, freedom from carbonizable substances, as determined by the U.S.P. acid test, is not alone a reliable index of purity and quality in white mineral oils. He demonstrated that the presence of small amounts of impurities, readily detectable by



ultraviolet absorption measurements, are the cause of instability to light. Studies in the laboratories of the Pennsylvania Refining Company have confirmed Schuurmann's findings and have indicated that these impurities are also the cause of instability at elevated temperatures. He has suggested that there are two groups of impurities, one consisting of alkylated symmetrical octahydrophenanthrenes, and the other of alkylated asymmetrical octahydrophenanthrenes, substituted tetrahydrophenanthrene, esters and sulfonates. These contaminants react photochemically at ordinary temperatures, especially in the presence of dissolved oxygen, to yield odoriferous substances as well as those responsible for imparting an unpleasant taste to the oils. In addition to such deterioration, discoloration can also occur at elevated temperatures. Posi-

tive control of heat and light stabilities may be secured by maintaining ultraviolet absorbances well below the threshold levels at which the instabilities begin to manifest themselves. Recent experience has shown that properly stabilized medicinal white oils which have ultraviolet absorbances below the limits proposed by Haenni and Hall (8) will possess satisfactory stability. To illustrate the differences between stable and unstable white oils, curves for some typical products are given in Figure II.

Natural inhibitors present in the raw oils are removed during the refining process. The higher the degree of refinement, the greater is the susceptibility of the product to oxidation. Hence it is necessary to add a small amount of suitable oxidation inhibitor to provide the desired stability and protect the oil against

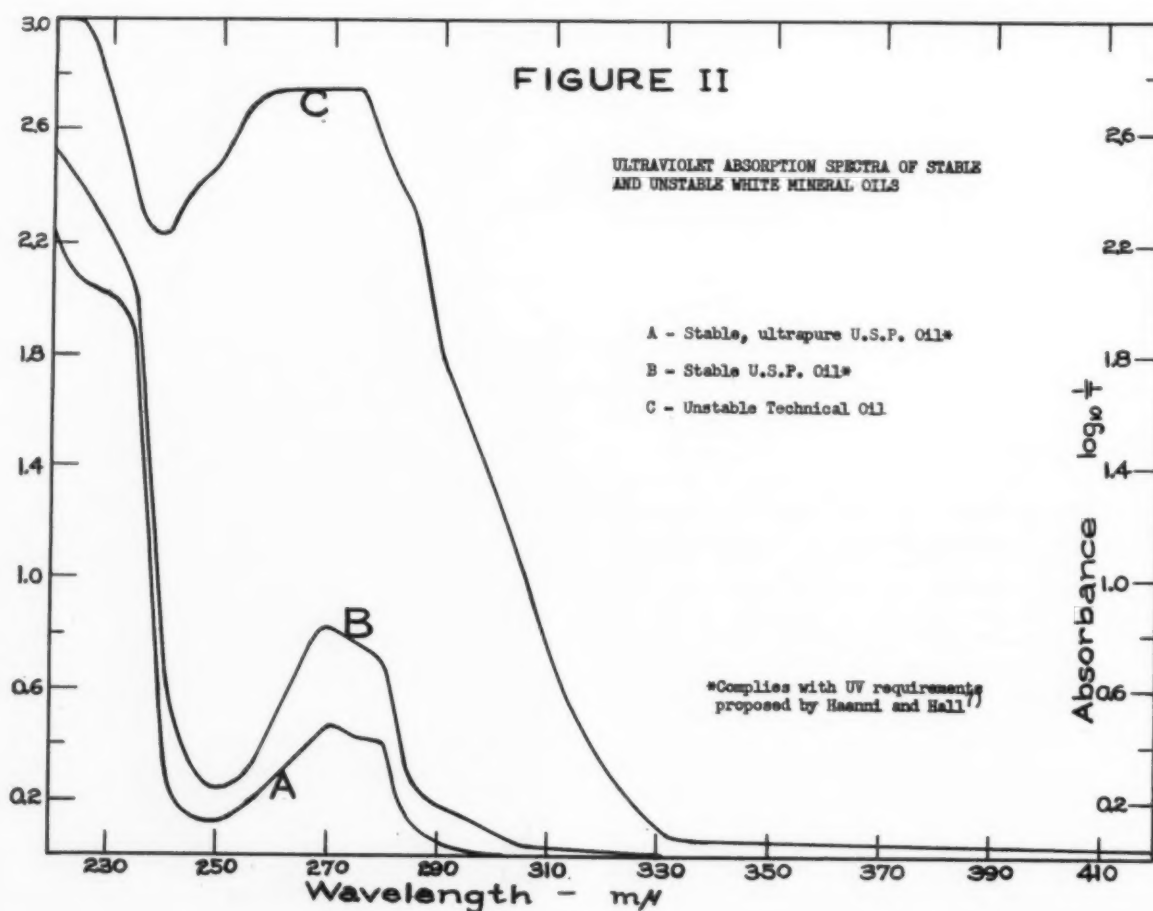
the action of oxygen. Obviously, only thoroughly tested, nontoxic, noncarcinogenic and otherwise suitable substances can be used. Inhibitors must be effective in very small amounts; otherwise they can degrade the product and spoil the U.S.P. acid test. Only a few parts per million of a good inhibitor are usually required for adequate protection.

The above considerations should explain why technical white oils, which are not fully refined to meet the U.S.P. acid test, fail to show acceptable stability to light and heat and readily develop unpleasant, objectionable odors and taste during exposure. In poorly refined oils, these odors can sometimes develop upon exposure to direct sunlight at room temperature for less than one hour. Such oils also show considerable discoloration upon heating. Hence the highest degree of purity provides insurance against deterioration of products which contain substantial amounts of white mineral oils, both during processing and while standing on the shelf. It also gives the manufacturer a sense of security which comes from the knowledge that, in using the finest products available, he should experience a minimum of customer complaints due to allergic susceptibility, irritation and the like.

When one considers the impact of recent legislation in the field of food additives on purity and free-

dom from toxicity and carcinogenicity, the innocuous nature of properly refined medicinal white oils assumes great importance and should be better understood. Because of the carcinogenic history of some crude or poorly refined petroleum oils referred to in older medical literature, misconceptions still persist, due to failure to recognize the vast differences, both chemically and biologically, between nondescript "mineral oils" and exhaustively refined U.S.P. and N.F. "white mineral oils", which are free from harmful aromatics. The facts of noncarcinogenicity and nontoxicity of the latter oils have been firmly established by exhaustive research completed during the past decade and accepted as the basis of favorable decisions by government agencies. Evidence of such recognition is the granting of an extension request early in 1960, under the 1958 Food Additives Amendment to the Federal Food, Drug and Cosmetic Act. Under the Delaney provisions of this Act, their use in food processing can only be permitted when there is evidence of the complete absence of carcinogens. Furthermore, medicinal white oils have so consistently been shown to be free of carcinogenic activity that they are often used as solvents and control materials in cancer investigations.

Among the most positive statements in support of the above are the following, quoted from the com-



prehensive and impressive contribution by Dietz, King, Priestly and Rehner (10): "Other evidence to be presented later in this paper shows quite clearly that in no case has it been possible to find carcinogenicity in any completely nonaromatic fraction of a potent oil. Thus, the nonaromatic components of slack waxes appear to act as diluents. This is supported by the fact that nonaromatic products, such as U.S.P. petrolatum and U.S.P. white oil, which are included . . . for purposes of comparison, were entirely without effect in the animal tests." These authors have also shown that petroleum fractions which boil below 700°F are innocuous, even in the crude state. Their illuminating correlations of tumor potency with molecular weights of unrefined petroleum fractions and pure aromatic hydrocarbons indicate that a peak is reached at about 275 average molecular weight in aromatics containing 4 to 6 condensed rings, with sharp declines in potency on both sides of maximum.

Clinical experience of white oils

More convincing evidence of the innocuous character of high quality white oils can hardly be found than in the gratifying clinical experience of hundreds of physicians with experimental emulsion vaccines. The emulsions were of the water-in-oil type and were prepared from a special light grade of N.F. white oil which functions as an adjuvant. These vaccines have been under study during the past thirteen years for the prevention of polio, influenza and various allergies. No cancers have been reported, regardless of the route of injection (11), namely subcutaneous, intramuscular, intraperitoneal, etc. Results have been most promising and may provide an important breakthrough in the treatment of some diseases. In a very recent article (12), Albert Q. Maisel reported that over 100,000 emulsion injections for influenza have been administered to civilians and members of the Armed Services since 1951 "without producing a single known long-term ill effect." Similar successful results were reported in the recent treatment of 4,000 patients suffering from hay fever and other allergies. It has been estimated that allergists treated as many as 50,000 patients with this type of vaccine in 1960.

It certainly seems logical to conclude that the evidence from both scientific and clinical studies is sufficient to establish firmly the innocuous, noncarcinogenic character of N.F. and U.S.P. white mineral oils. This may be accounted for by the inertness of these nonpolar hydrocarbons resulting from the drastic sulfonation treatment. It is this stage of the refining process which eliminates reactive aromatics and other constituents and converts any accompanying carcinogens to impotent substances.

Questions are frequently asked concerning the ability of white oils to penetrate normal skin. From the literature on this subject, it is quite clear that the evidence is in the negative. The relatively inert nature of white mineral oil is in itself an indication that penetration should not be expected. However, this does not mean that the skin will not absorb appreciable amounts of these oils from lotions and creams and even from anhydrous preparations. The quantity absorbed will increase with lowering of viscosity. This is especially noticeable when the viscosity

of the oil is approximately 40, which is not much higher than that of water. Absorption is also increased when the skin is dry. By controlling viscosity and the percentage of white oil in the preparation, most of the undesirable "greasiness" or "oiliness" can be eliminated. Further enhancement in the "cosmetic feel" may be obtained by the judicious incorporation of waxes, surface active agents such as the well known lanolin derivatives, and silicones, especially in combination with emulsified water. An interesting discussion of the penetration of skin by oils is given by Marriott (13).

The main functions of the white oil are to provide emollience, lubrication, and to serve as a carrier or "base" for other ingredients. These properties are so well understood that further discussion here does not appear warranted. In addition to these functions, however, the nonpolar hydrocarbons in white oils also play other important roles in specialized formulations such as protective and cleansing creams, ointments, and lotions manufactured for cosmetic, pharmaceutical and industrial use. Considerable attention during recent years has been devoted to the study of the "barrier" effect of white mineral oils. In the work by Powers and Fox (14), it was shown that a light white oil produced an average reduction of 28 percent in the moisture loss from the skin under the conditions of the experiments. When the barrier or protective function is paramount, the preferred viscosity of the white oil is usually in the higher ranges, although final choice will depend on the aims of the formulator and the specific end use of the product.

Lower viscosity oils "win" consumer

In cleansing creams and lotions, the obvious function of the oil is to serve as a solvent and vehicle for removal of solid and fluid soil and the oil-soluble excretions which accumulate in the hair follicles and on the surface of the skin. Experience has shown that white oils best perform this function in emulsified preparations. Oils with viscosities between 40 and 90 are most commonly used for this purpose. As would be anticipated, the solvent action increases rather rapidly as the viscosity of the oil decreases. Formulations containing the lower viscosity oils are also more acceptable to the consumer because of the more pleasant "cosmetic" reaction during application and freedom from the sensation of greasiness. It might be mentioned here that a former objection by some to the use of white oils, based merely on an assumed "degreasing" action on the skin, has practically disappeared in recent years. Chemists generally are now well aware of the important place that white oils occupy in cosmetic and pharmaceutical formulations. Their nonreactive nature, freedom from odor and high degree of stability substantially extend the shelf life of many products, especially when they contain perfumes which are sensitive to deterioration.

These benefits were well stated by Hilfer (15), who made the provocative observation that the value of these oils is often underrated because of their low cost. Advantages over other types of oils will also be found in ease of handling, stability in storage, ease of emulsification and uniformity of properties.

Of increasing importance in the development of



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new products is the "carrier" or "base" function of white mineral oils. In many products, they perform this function in an ideal manner due to their non-polar, relatively inert character and the fact that they do not penetrate or irritate the skin or mucous membranes, do not combine with the active ingredients to cause a loss of potency and are extremely stable chemically. This doubtless explains why their use in the emulsified vaccines as mentioned above, has met with such success.

Trend of future developments

Official and public demand for unquestionable safety and purity in all products applied to the skin and hair should lead to the gradual elimination from cosmetics of inferior grades of "technical white oils." These are still being used in large volumes in some low-priced brillianines, hair dressings, etc., but could well be replaced by oils of medicinal quality which are free from suspicion. Few, if any, such changes would be called for in pharmaceutical products because the industry has long insisted on the highest possible quality standards and has done much to raise these standards. Since white mineral oils are now available in a purity which approaches the ultimate, it seems logical to predict that future developments will be in the direction of greater specialization and more rigorous and detailed specifications. This would lead to greater discrimination in the selection of the specific white oil that would provide the maximum processing and sales advantages for the manufacturer with the highest degree of product effectiveness for the consumer. A study of new methods for enhancing the cosmetic "feel" of hydrocarbon oils could further extend their field of usefulness and acceptability. With all the natural advantages in recognized freedom from carcinogens, toxicants and irritants and the added advantages in stability, uniformity, ease of handling and relatively low cost, we can foresee a continuing growth in the use of high quality white mineral oils in cosmetic and pharmaceutical formulations.

Acknowledgement

Table I was arranged by Charles Steenbergen, who also computed the indices and Waterman analyses. The author gratefully acknowledges his assistance and that of other members of the Pennsylvania Refining Company staff who cooperated in preparing data for this paper.

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Reprinted from the Canadian Pharmaceutical Journal **93**, No. 8, p. 62, 1960

This year "Red Moscow," "Sputnik," and "Treasure Chest" perfumes will hit our markets. This is new competition from Russia. Just how potent this competition will be remains to be seen. But it behooves us *now* to look at the facts filtered from behind the "red curtain".

Here's the latest insight into

Production of Essential Oils and Synthetic Scents in Russia Today

BY PETER W. SHERWOOD,
Research Engineer

Under current plans, the perfumery industry in the U.S.S.R. is slated for major expansion. The seven-year plan promulgated in 1958, provides for a 1965 output of all perfumery chemicals and oils at 65% above the 1958 level. Emphasis between the growth of natural oils and synthetic perfumery materials is divided as follows:

	1958 OUTPUT (METRIC TONS)	INCREASE, 1965 VS. 1958
Natural oils	899	59.7%
Synthetic perfumery materials	2447	69.5%

This represents the steepest rate of increase since the immediate post-war period. It was then that Russia was hard-pressed to recover the production of perfumery materials which had been lost as a result of World War II. During the war, physical

destruction and territorial occupation reduced production of natural essential oils to 7% of pre-war level (48 tons in 1946 vs. 646 tons in 1940). In 1952, the pre-war position was regained. Similarly, output of synthetic perfumery materials dropped 52% (634 tons in 1940 to 370 tons in 1946). Production trends during subsequent years is shown in Fig. 1.

As in all countries, recent trends in the Russian perfume industry show growth of synthetic raw materials production has been greater than natural oils. Synthetics have grown 13% (annual average) during 1951-1958.

In this period, synthetics constituted between 72 and 79% of all perfumery materials used. By comparison, synthetics made up only 57% of the total in 1940. The present ratio is projected into 1965, when synthetics are forecast to make up 78% of total perfuming agents. However, there is considerable effort devoted to the synthesis of oils which are currently

Overall Composition of Essences Used in Perfumery and Cosmetic Products of the USSR

Type of Essence	MEAN CONTENT IN THE PERFUME PORTION OF:			
	Perfumes	Toilet Soaps	Cosmetics	Food Essences
Natural Essential Oils	20.8	15.0	63.2	15.8
Synthetic Essences:				
Simple and				
Complex esters	27.6	40.4	10.0	73.7
Alcohols	25.4	28.4	18.0	.3
Aldehydes	13.6	1.0	3.0	8.9
Ketones, lactones, and other synthetics	11.4	8.5	5.6	1.2
Miscellaneous	1.2	6.7	0.2	0.1
	100.0	100.0	100.0	100.0

obtained in the U.S.S.R. from natural sources (oil of mint, menthol, oil of citronella, etc.). Early success in this area is expected to boost the percentage of synthetics in the total field of perfumery products.

Naturally, the proportion of synthetics in the overall perfume formulation differs widely by product, and the following percentages are given for 1965: Dental preparation—2.5% synthetic perfume materials, toilet soaps—82% synthetic detergents—90% various food essences—80% perfumes—80%. A more detailed analysis in the table above shows materials in various essences in effect during 1958.

Within the field of synthetic perfumery agents, a shift in product distribution is noted over the years:

TYPE OF PRODUCT	% OF 1940 OUTPUT	% OF 1958 OUTPUT
Simple and complex esters	44.5	55
Alcohols	37	24
Lactones, Ketones, etc.	9	8
Aldehydes	9.5	13

The number of synthetic oils now available to the Russian perfume industry is still fairly limited. In 1959, about 120-130 different kinds were offered. This compares with 250-300 types available to producers in the U. S. and Western Europe. Russia turned out 45 different esters in 1958 while the Dutch firm "Naarden", alone, listed 110 esters.

To remedy this situation of insufficient variety, much Russian activity has been reported. During the post-war period, production was begun on some twenty new synthetic essential oils, among them: hydroxycitronellal, sandalidol, tibetol, cyclamen-aldehyde, oil of citronella, etc. Special emphasis has been placed on expanding the production of synthetic products which had previously been imported, such as xanillin (1958 output was 6.6 times that of 1940), heliotropine (35 times), isoeugenol (7.6 times), anisaldehyde (28 times), etc.

At the same time, progress is reported toward reducing cost of manufacturing synthetic perfumery ma-

terials. I. M. Torbin gives the following breakdown for average cost of producing such chemicals during 1958:

Raw materials	90.8%
Auxiliary materials	0.8
Heat and electricity	1.3
Labor, including benefits	4.2
Amortization	1.3
Miscellaneous costs	1.6
	100.0

Unit production costs are being improved by increasing plant size and installation of more extensive automation and instrumentation. However, the main cost reduction potential clearly exists in decreasing raw materials consumption. A recent article in *Ekonomika Khimicheskoy Promyshlennosti* (Economics of Chemical Production) reports progress in some synthetics as follows:

SYNTHETIC PERFUMERY MATERIAL	RAW MATERIAL	RAW MATERIAL CONSUMPTION, LBS/LB		
		1950	1955	1958
Benzyl acetate	Benzyl chloride	1.37	1.26	1.28
Heliotropine	Ethereal oil of saffronin	3.3	2.1	2.06
Hydroxycitronellal	Ethereal oil of coriander	12.5	7.5	7.1
Ionone	Ethereal oil of coriander	4.1	3.8	3.7
Jasmine aldehyde	Caster oil	9.9	6.0	5.6

As yet, there is no commercial production of synthetic citral or ionone on the basis of such less expensive raw materials as isoprene, acetone, and acetylene. Syntheses of these are industrial practice in the U. S. Current Russian research is directed toward this objective to supplant the costly oils of coriander and citronella which serve presently as raw materials.

An improvement in the quality of perfumery agents is called for by the current seven-year plan. For example, products with the odor of lilac are widely favored in Russia. Lilac-odored perfumes are marketed under the names "Lilac," "White lilac," "Evening," "Pearl," etc. and much toilet soap is scented in the same manner. It is felt, however, that the available terpineols, on which the lilac scent is based, are not adequate for the production of the more sophisticated kinds of perfume. Accordingly, the line is to be extended by the production of stable oils extracted from lilac flowers which are suitable for extensive cultivation in many areas of Russia.

Along the same line, there are only two products currently produced with the odor of jasmine, namely benzyl acetate and jasmine aldehyde. To round out this line, it has been necessary to import 5-6 tons of other jasmine-scented products yearly. Of late, there has been some Russian pilot work toward the production of dihydrojasnone and a material known as "Jasmone 7," and there is some pressure for early commercialization of additional jasmine-scenting agents.

Among outlets for essences, the greatest growth rate of recent years has been in the higher types.

Growth in the Production of Scenting Materials in the U. S. S. R.

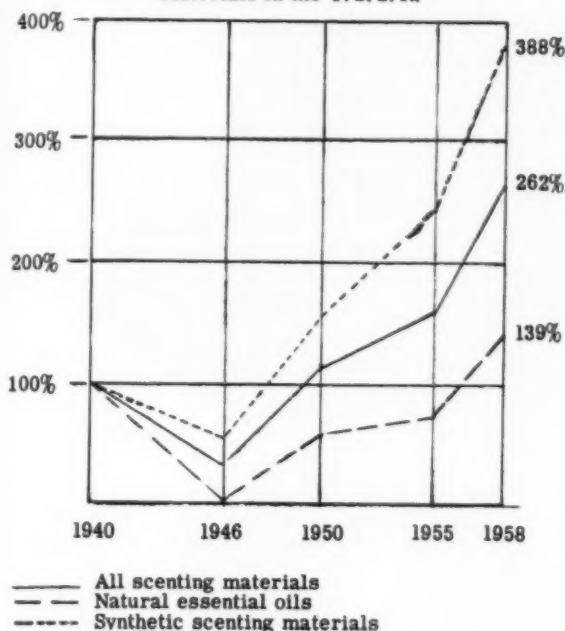


Figure 1. There has been a steady increase in production of all scenting materials in Russia since 1946. The synthetics have had the greatest growth.

On a constant price basis, the output of all perfumery materials rose 2.8 times during the years 1940-1958, but the production of perfumes and eau de colognes increased 8.6 times. Present distribution of all essences in end product fields is estimated, on a price basis, as follows:

Perfumes and colognes	—	60%
Cosmetic products	—	25%
Toilet soaps	—	15%

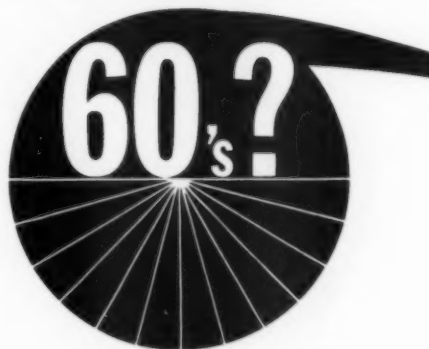
This shift toward the more valuable products has meant replacing some of the less costly natural scents with more expensive synthetic products. This change has not always been for the best, however, and Torbin complains that substitution of synthetic scents for natural products in certain toilet soaps has sometimes led to an inferior product. This is largely due to the use of too high a percentage of complex esters, many of which are unstable in alkaline medium.

Despite these occasional shortcomings, however, there appears to be a general upgrading in quality and increase in range of perfumery materials and essences available in the U.S.S.R. Research effort in this field is geared toward improving present production methods and developing methods of synthesis. This will broaden the base of the perfumery industry and decrease the industry's dependence on natural essential oils and on imports of special ingredients.

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Much of the information reported herein is based on I. M. Torbin, *Ekonomika Khimicheskoy Promyshlennost*, 1960 No. 4, 443 pp. Additional information is taken from recent issues of the Russian perfumery trade journal *Masloboino-zhirovaya promyshlennost*, and in Byelov, V.N., et al. *Uspekhi Khimii Dushistikh Veshchestv* (1956).

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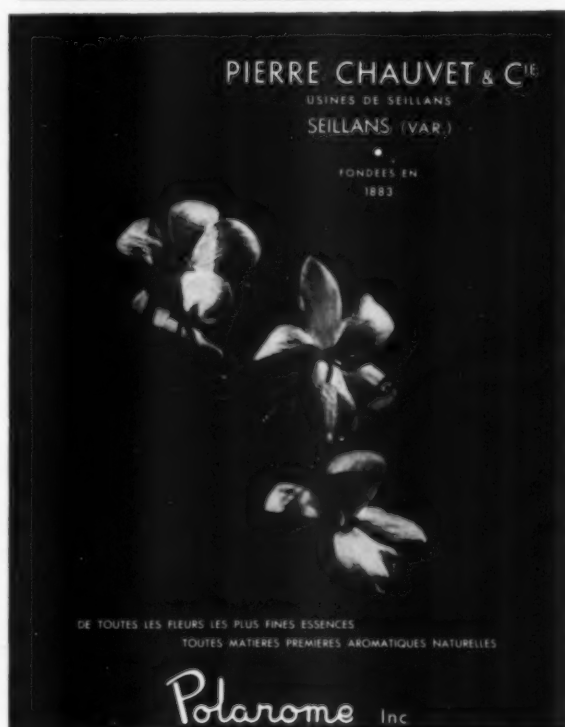
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How Vapors of Aromatic Chemicals Affect Bacteria

by JASPER C. MARUZZELLA, MICHALYN M. GAROFALO, and JOSEPH S. CHIARAMONTE
Long Island University, Biology Department, Brooklyn, New York.

Previous investigations in this laboratory have revealed that a number of perfume oils were active in destroying microorganisms either by direct contact with the oils (1) or their vapors (2, 3). Perfume oils are composed of mixtures of natural essential oils and odoriferous (aromatic) organic chemicals. And in recent years more emphasis has been placed upon the wider use of synthetic aromatics.

Essential oils and their vapors have long been reported to prevent the growth of bacteria and fungi (4-11). While some investigations on the antimicrobial activity of aromatic chemicals have appeared in the literature (12-14), data on their vapor activities appear to be lacking. This investigation, therefore, was initiated and deals with the preliminary screening of a variety of aromatic chemical vapors at full strength against Gram positive and Gram negative bacteria *in vitro*.

Materials and methods

The vapors of 192 aromatic chemicals were tested *in vitro* against growing cultures of *Bacillus subtilis* var. *aterrimus* ATCC 6461, *Serratia marcescens* ATCC 9986, *Staphylococcus aureus* OX-H, *Escherichia coli* ATCC 11229, and *Mycobacterium avium* ATCC 4676. All of the test organisms were cultivated on nutrient agar and broth at 37°C., except *M. avium* which was grown in nutrient agar and broth containing 5% glycerol.

The method used to test the effects of the vapors on bacteria was previously described (11). In this method 15 ml of nutrient agar were poured into Petri dishes and allowed to harden. The surface of the agar was

then streaked with 0.5 ml. of a 48-hour broth culture of the test organism (*M. avium* broth culture was 72 hours old). Aluminum caps (20 mm. diameter by 5 mm. deep) containing 0.5 ml. of aromatic chemical were placed on the inner surface of the Petri dish top. When the dishes were inverted and incubated the surface of the chemical in the cap was at a distance of about 5 mm. from the surface growth of the organisms. The 48 hour incubation period (*M. avium* was incubated for 72 hours).

After incubation the presence of a definite zone of inhibition on the surface of the agar indicated that the vapor possessed antibacterial activity. The larger the zone, the greater the activity. The diameters of the zones of inhibition were measured by a metric ruler with the aid of an illuminated Quebec Colony Counter. All dishes were conducted in triplicate with one cap per dish. In some tests the vapor permitted no growth to occur on the surface of the entire dish. When this event took place the zones of inhibition were recorded as 90 mm. which is the inside diameter of the Petri dish.

Results and discussion

Vapors of 192 aromatic chemicals consisting of 5 acetals, 3 acids, 24 alcohols, 17 aldehydes, 114 esters, 3 ethers, 14 ketones, 5 lactones, and 7 miscellaneous were tested for antibacterial activity. The results are found in Table 1. From this table it may be observed that of the 192 chemical vapors tested, 167 (87%) possess some activity against at least one of the five test organisms. The remaining 25 chemical vapors were completely inactive. Further inspection of the

data shows that vapors of 162 chemicals (84%) were active against *M. avium* with 72 chemical vapors clearing the entire dish of bacterial growth. Vapors of 114 chemicals (59%) exhibited activity against *B. subtilis* var. *aterrimus*, 86 vapors (44%) were active against *S. aureus*, 48 vapors (25%) against *E. coli*, and 47 vapors (24%) showed activity against *S. marcescens*. This indicates that *M. avium* is the most vulnerable organism while *S. marcescens* the least vulnerable, and that Gram positive bacteria are more susceptible to the vapors than Gram negative.

It is interesting to note that essential oil vapors were also reported to be extremely lethal to Gram positive bacteria especially *M. avium* (10). The extreme susceptibility of the acid fast *M. avium* to the vapors tested is certainly a reflection of the differences in

the chemical composition of this cell as compared to the non-acid fast bacteria used in this study. Perhaps the vapors are able to alter or split the firm lipo-protein complexes in *M. avium* disrupting the permeability properties of the cell.

Table 2 was constructed from the data in Table 1. It shows that the vapors of aromatic acids possess the highest percentage of antibacterial activity, followed by aldehydes, ketones, alcohols, miscellaneous, esters, ethers, acetals, and lactones.

The results presented clearly demonstrate that a great number and variety of aromatic chemical vapors possess a wide range of antibacterial properties. This is especially true of: heptaldehyde, hydratropic aldehyde, nonyl aldehyde, iso-amyl formate, n-butyl propionate, ethyl caproate, ethyl propionate, ethyl iso-

Table 1.—Inhibitory Activity of Aromatic Chemical Vapors

Vapors	Diameter of Zone of Inhibition in mm.				
	<i>B. subtilis</i> var. <i>aterrimus</i>	<i>S. marcescens</i>	<i>S. aureus</i>	<i>E. coli</i>	<i>M. avium</i>
ACETALS:					
Decyl aldehyde dimethyl acetal	0	0	0	0	90
Hydratropic aldehyde dimethyl acetal	20	0	25	20	60
Hydrocitronellal dimethyl acetal	0	0	0	0	0
Phenyl acetaldehyde dimethyl acetal	25	0	25	25	30
Phenyl acetaldehyde phenylethylene glycol acetal	0	0	0	0	0
ACIDS:					
n-Caproic acid	47	34	41	37	52
Heptic acid	35	6	31	25	40
iso-Valeric acid	60	50	50	50	60
ALCOHOLS:					
beta-Amyl cinnamyl alcohol	0	0	0	0	0
Anisyl alcohol	0	0	0	0	0
Benzyl alcohol	25	25	23	0	35
Cedrol	40	0	34	0	40
Cinnamyl alcohol	0	0	0	47	25
Citronellol	30	0	35	0	90
1-Decanol	23	0	60	0	45
Dimethyl benzyl carbinol	25	20	0	20	35
3,7-Dimethyl-1-octanol	35	0	65	0	90
1-Dodecanol	0	0	50	0	25
Geraniol	30	0	40	0	40
1-Heptanol	90	40	45	40	90
1-Hexanol	50	55	45	40	90
Linalool	27	11	35	35	90
Methyl Cinnamic alcohol	0	0	0	0	60
1-Nonanol	60	0	65	0	90
1-Octanol	40	25	50	40	90
ALDEHYDES:					
Phenyl ethyl dimethyl carbinol	0	0	0	0	40
Phenyl propyl alcohol	0	0	0	0	20
iso-Pulegol	40	30	45	40	40
Sterolyl alcohol	15	25	0	0	35
Tetrahydrolinalool	70	0	70	0	90
1-Undecanol	10	0	80	0	40
Vetiverol	0	0	0	0	25
alpha-Amyl cinnamic aldehyde	0	0	0	0	0
Anisic aldehyde	20	40	25	20	30
Citronellal	90	0	90	0	90
Citronellyl oxyacetaldehyde	23	0	50	0	33
Cyclamen aldehyde	45	0	34	0	65
Decyl aldehyde	90	0	90	0	90
Dedecyl aldehyde	90	0	90	0	90
Heptaldehyde	90	90	90	90	90
alpha-Hexyl cinnamic aldehyde	0	0	0	0	45
Hydratropic aldehyde	40	80	90	90	90
Hydroxycitronellal	0	0	0	0	0
alpha-Methyl cinnamic aldehyde	25	0	25	28	20
Methyl nonyl acetaldehyde	20	0	30	0	90
Nonyl aldehyde	90	45	90	90	90
Phenyl acetaldehyde	56	40	55	50	90
Phenyl Propyl aldehyde	54	45	40	54	22
Undecyl aldehyde	90	0	90	0	90
ESTERS:					
Allyl caproate	40	0	0	0	90

Vapors	Diameter of Zone of Inhibition in mm.					Vapors	Diameter of Zone of Inhibition in mm.				
	<i>B. subtilis</i> var. <i>aterrimus</i>	<i>S. marcescens</i>	<i>S. aureus</i>	<i>E. coli</i>	<i>M. avium</i>		<i>B. subtilis</i> var. <i>aterrimus</i>	<i>S. marcescens</i>	<i>S. aureus</i>	<i>E. coli</i>	<i>M. avium</i>
Allyl heptoate	0	0	0	0	90	Dimethyl benzyl carbonyl acetate	30	0	20	0	33
iso-Amyl acetate	0	90	90	90	90	Ethyl benzoate	45	20	30	0	90
iso-Amyl benzoate	0	0	0	0	40	Ethyl n-butyrate	90	90	90	90	0
iso-Amyl n-butyrate	90	0	40	0	90	Ethyl iso-butyrate	90	90	90	90	0
iso-Amyl caproate	0	0	0	0	90	Ethyl caproate	90	35	90	90	90
iso-Amyl cinnamate	0	0	0	0	0	Ethyl caprylate	20	0	0	0	90
iso-Amyl formate	90	90	90	90	90	Ethyl cinnamate	10	0	0	0	30
iso-Amyl laurate	0	0	0	0	0	Ethyl decylate	0	0	0	0	90
iso-Amyl phenyl acetate	0	0	0	0	30	Ethyl heptoate	35	0	25	0	90
iso-Amyl propionate	90	0	90	0	90	Ethyl laurate	0	0	0	0	50
iso-Amyl salicylate	0	0	0	0	37	Ethyl methyl phenyl glycidate	0	0	0	0	0
iso-Amyl iso-valerate	28	0	0	0	90	Ethyl pelargonate	15	0	0	0	90
Amyris acetate	0	0	0	0	24	Ethyl phenyl glycidate	0	0	0	0	0
Anisyl acetate	0	0	0	0	20	Ethyl propionate	90	90	90	90	90
Anisyl formate	0	0	0	0	24	Ethyl salicylate	35	0	0	0	90
Anisyl propionate	0	0	0	0	0	Ethyl iso-valerate	90	90	90	90	90
Benzyl acetate	28	31	25	28	40	Ethylene brassylate	0	0	0	0	0
Benzyl benzoate	0	0	0	0	0	Geranyl acetate	20	0	25	0	90
Benzyl n-butyrate	0	0	0	0	30	Geranyl n-butyrate	0	0	0	0	15
Benzyl iso-butyrate	22	0	0	0	35	Geranyl formate	35	0	32	0	90
Benzyl formate	25	32	36	40	45	Geranyl phenyl acetate	0	0	0	0	0
Benzyl phenyl acetate	0	0	0	0	0	Geranyl propionate	0	0	0	0	22
Benzyl propionate	18	35	20	0	35	Guaiac wood acetate	10	0	0	0	0
Benzyl salicylate	0	0	0	0	0	Heptyl acetate	50	0	60	0	90
Benzyl iso-valerate	10	0	0	0	20	Heptyl formate	90	90	90	90	90
iso-Bornyl acetate	90	0	35	0	90	Hexyl acetate	90	60	90	60	90
iso-Bornyl formate	90	0	0	0	38	Hexyl caprylate	0	0	0	0	0
iso-Bornyl propionate	80	0	0	0	90	Lauryl acetate	0	0	0	0	24
iso-Butyl benzoate	27	0	0	0	25	Linalyl acetate	60	0	25	0	90
n-Butyl n-butyrate	30	20	50	20	90	Linalyl iso-butyrate	0	0	0	0	0
iso-Butyl n-butyrate	70	0	75	0	90	Linalyl cinnamate	15	10	0	15	30
iso-Butyl caproate	0	0	0	0	90	Linalyl formate	44	39	36	36	90
iso-Butyl cinnamate	0	0	0	0	20	Linalyl propionate	0	0	0	0	30
iso-Butyl formate	0	90	90	90	0	Methyl cinnamate	20	0	20	0	55
iso-Butyl phenyl acetate	35	90	30	40	37	Methyl phenyl acetate	26	0	15	24	50
n-Butyl propionate	90	90	90	90	90	Methyl phenyl carbonyl acetate	25	0	25	30	70
iso-Butyl salicylate	18	0	0	0	90	Neryl acetate	10	0	0	0	50
n-Butyl iso-valerate	35	0	0	0	90	Nonyl acetate	20	0	25	0	90
iso-Butyl iso-valerate	19	0	0	0	90	Octyl acetate	75	18	25	0	90
Cedryl acetate	45	0	0	0	90	Octyl iso-butyrate	0	0	0	0	25
Cinnamyl acetate	0	0	0	0	23	Octyl formate	90	0	90	6	90
Cinnamyl iso-butyrate	0	0	0	0	17	Phenoxy ethyl iso- butyrate	0	0	0	0	0
Cinnamyl formate	12	22	16	0	40	Phenyl ethyl n-butyrate	0	0	0	0	22
Cinnamyl propionate	0	0	0	0	0	Phenyl ethyl iso-butyrate	10	0	0	0	32
Cinnamyl iso-valerate	0	0	0	0	20	Phenyl ethyl dimethyl carbonyl acetate	0	0	0	0	25
Citronellyl acetate	25	0	0	0	90	Phenyl ethyl formate	16	40	20	0	90
Citronellyl n-butyrate	0	0	0	0	0	Phenyl ethyl phenyl acetate	0	0	0	0	0
Citronellyl iso-butyrate	0	0	0	0	10	Phenyl ethyl propionate	0	0	0	0	30
Citronellyl formate	35	0	30	0	90	Phenyl ethyl iso-valerate	0	0	0	0	21
Citronellyl propionate	0	0	0	0	20	Phenyl propyl acetate	18	20	0	0	35
para-Cresyl acetate	40	30	0	0	90	Propyl acetate	0	90	30	90	20
para-Cresyl octylate	0	0	0	0	0	iso-Propyl cinnamate	22	0	0	0	25
para-Cresyl iso-valerate	0	0	0	0	60	n-Propyl propionate	90	90	90	90	0
Decyl acetate	0	0	0	0	90						
Diethyl sebacate	0	0	0	0	0						
Diethyl succinate	0	0	0	0	50						

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Vapors	Diameter of Zone of Inhibition in mm.				
	<i>B. subtilis</i> var. <i>sterilis</i>	<i>S. marcescens</i>	<i>S. aureus</i>	<i>E. coli</i>	<i>M. avium</i>
Terpinyl acetate	50	0	0	0	90
Terpinyl propionate	0	0	0	0	62
Undecylenic acetate	0	0	0	0	80
Vetiveryl acetate	10	0	19	0	20
ETHERS:					
iso-Amyl benzyl ether	75	0	0	0	90
Dibenzyl ether	0	0	0	0	35
iso-Safrol	35	0	20	0	90
KETONES:					
Acetophenone	35	0	30	0	90
Acetyl valeryl	25	35	90	30	90
Allyl ionone	0	0	0	0	25
Di-n-propyl ketone	35	90	90	90	90
pseudo-Ionone	0	0	21	0	25
para-Methoxy acetophenone	0	0	0	0	31
para-Methyl acetophenone	30	0	35	40	56
Methyl heptenone	90	90	40	90	90
Methyl hexyl ketone	90	60	60	50	90
beta-Methyl ionone	27	0	0	0	55
delta-Methyl ionone	35	0	0	0	90
gamma-Methyl ionone	30	0	0	0	90
pseudo-Methyl ionone	0	0	0	0	27
Methyl nonyl ketone	20	0	25	0	90
LACTONES:					
Benzo dihydro pyrone	0	0	0	0	20
gamma-Decalactone	0	0	0	0	33
gamma-Heptalactone	50	0	0	0	35
gamma-Nonalactone	0	0	0	0	30
gamma-Octalactone	5	0	0	0	30
MISCELLANEOUS:					
Diphenyl methane	90	0	0	0	90
Eugenol	30	0	25	25	25
acet-Eugenol	0	0	0	0	0
iso-Eugenol	24	0	8	0	20
Methyl eugenol	10	0	0	0	35
Methyl-iso-eugenol	0	0	0	0	25
Tetra-hydra-para methyl quinoline	0	0	30	20	40

valerate, heptyl formate, hexyl acetate, di-n-propyl ketone, and methyl heptenone.

Exactly how short a period of time these vapors will exert their lethal activity against bacteria has not been determined. The water solubility and vapor pressure of the chemicals likewise has not been considered in this study. These factors will be dealt with in future investigations.

Summary

The *in vitro* antibacterial activity of the vapors of 192 aromatic chemicals was investigated. Data presented indicate that 87% of the vapors tested inhibited the growth of at least one of the 5 test organisms.

The most vulnerable bacterium was *M. avium* while the least vulnerable was *S. marcescens*. The Gram positive bacteria were more greatly inhibited than the Gram negative.

In general, the vapors of the groups of chemicals were found to possess the following order of decreasing antibacterial activity: acids, aldehydes, ketones, alcohols, miscellaneous, esters, ethers, acetals, and lactones.

Vapors of the following chemicals were found to produce large zones of inhibition against all test organisms: heptaldehyde, nonyl aldehyde, iso-amyl formate, n-butyl propionate, ethyl caproate, ethyl propionate, ethyl iso-valerate, heptyl formate, hexyl acetate, di-n-propyl ketone, and methyl heptenone.

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Table 2.—Inhibitory Activity of Groups of Chemical Vapors

	Number Tested	Number of Tests on Organisms	Number of Tests with Antibacterial Activity	% Tests with Antibacterial Activity
Acetals	5	25	9	36%
Acids	3	15	15	100%
Alcohols	24	120	68	56%
Aldehydes	17	85	56	65%
Esters	114	570	240	42%
Ethers	3	15	6	40%
Ketones	14	70	41	58%
Lactones	5	25	7	28%
Miscellaneous	7	35	15	43%
TOTAL	192	960	457	47%



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Your Duty: WARN the allergic consumer

By FRANK J. CHUT, Attorney, Schering Corporation, Bloomfield, N. J.

IT IS UNDOUBTEDLY TRUE that the allergic plaintiff, whether he brings his case in tort or for breach of warranty, has generally encountered substantial difficulties on the road to recovery. The great majority of jurisdictions deny recovery under either theory where it is found that the injury may be attributed to an allergic condition of the plaintiff. (1) Thus, in a recent Iowa Supreme Court decision, recovery against a cosmetic manufacturer and retailer was denied a plaintiff who was injured because of his allergic reaction to the product, the court stating that such holding was in accord with the weight of authority. (2)

Though this is at present true, it is nevertheless clear that liability toward the allergic consumer is an expanding concept which may in the future prove increasingly troublesome to the manufacturer of cosmetics, drugs and perhaps even foods. (3) In addition to a sizable body of critical legal literature (4) which has developed in recent years, there are reported a number of strongly reasoned minority decisions. (5) Coupled with the greater medical knowledge of the cause and effect of allergic reactions, (6) these developments have provided the ever-alert plaintiff's bar with the needed tools to destroy the defense of "no liability because of plaintiff's allergy."

The scope of this paper will be limited to a discussion of liability in negligence for failing to warn an allergic consumer. Since this situation is most typical in the cosmetic industry, the discussion of cases will be generally confined to that area. The problems involved in breach of warranty are in essence different and have been discussed elsewhere. (7)

Without delving into its fine medical points, allergy

is generally understood to be the process of sensitization of the individual to a particular substance so that when the body again comes in contact with that substance, one of a number of allergic reactions, such as itching, swelling, etc., sets in. (8) Hence, the first contact sets the condition and the second produces the result. It has been compared with the process of immunization to an infectious disease:

The theory of immunization, e.g., to typhoid, is to introduce a small quantity of the disease agent into the human body; antibodies are formed by the body to combat the infectious disease, and these antibodies remain in the bloodstream or elsewhere in the body to fight off any future invasions by the same disease agent. The allergic diseases are similar in process, in that the body becomes sensitized by introduction into the body of some foreign agent—not necessarily toxic in nature—perhaps a synthetic chemical in a fingernail preparation, or a chemical in a dye, or a protein in a food, or the like—the sensitization coming about by the formation of antibodies by the body to cope with the presence of the foreign agent. Once the body has become sensitized to a particular foreign substance, upon exposure again to the same foreign substance a violent reaction occurs—between the foreign substance itself, called an antigen, and the antibodies which were formed upon first exposure to that antigen. The results of the antigen-antibody biochemical reaction—hay fever, asthma, skin diseases—are the symptoms that make up one or another of the various allergic diseases. (9)

Hence, the plaintiff's "peculiarity" or "idiosyncrasy" is simply a chemical cause-and-effect reaction; once one has knowledge of the cause of a particular reaction he can be held to a foreseeability of its effect.

One major inquiry is whether any group of individuals who are each allergic to the same substance can constitute a known legal class to whom a duty

would be owed. If we contrast the cases of individuals susceptible to infectious diseases such as typhoid and individuals susceptible to certain antigens, we see no real difference; one is no more peculiar than the other in regard to a rational basis of legal protection. (10) It would not seem to be straining the point to say that the same liability should apply to the manufacturer who allows a known antigen in his product without warning the known susceptible purchaser as to the manufacturer who would sell milk containing bacilli, although such milk would only affect those who were susceptible, at the time, to an infectious disease. The logical basis of liability should not vacillate according to the size or probability of the known susceptible class. Once it is established that certain people react to certain contacts and the effects of such contacts are known, then each is a member of a known class. Each is not a single individual different from normal society, but rather a person of a certain type, of whom there may be many or few, who is reacting normally in a given physical context.

Although convincing the court of the true factual basis of allergic reactions does not of itself establish liability, it does give the court and the jury a more sound basis upon which to decide whether the allergic reaction was or was not foreseeable in the particular situation. It affords a more reasonable approach than considerations based on sweeping statements of peculiarity or idiosyncrasy.

Failure to warn is negligence

Recognition of allergic consumers as a definite class of people who are or can be known is fundamental to the concept of foreseeability. The fact of foreseeability, in turn, bottoms every conclusion of whether a manufacturer or distributor was under a duty to warn. Once it can be proved that the defendant knew or should have known of the danger even to an allergic class of consumers it should follow that most courts would allow recovery. (11)

The cases, while generally labeled as regarding allergy to be a defense, have taken a number of approaches. In the 1956 case of *Bish v. Employers Liability Assurance Corporation, Ltd.*, (12) a negligence action for urticaria caused by a home permanent application, the court held that no warning was required for a product innocuous to normal people, though an injury did result from sensitivity or allergy of the plaintiff. Cited with approval was a 1941 New South Wales decision (13) which flatly declared that a seller, in the absence of special circumstances, owed no duty at all to the abnormal buyer.

These cases are typical of the old common law view, shaped at a time when knowledge about allergies was nonexistent, which considered the reasonable and prudent man free of liability for something he could not know of at the time. Although both decisions can be justified on the ground of lack of foreseeability, they create only confusion by their use of broad general statements which have lost their significance as legal terms under present-day knowledge. (14)

Some courts have taken another position, requiring the manufacturer to give an appropriate warning of any known dangers which the user of his product

would not ordinarily discover if it is found that the manufacturer had prior knowledge of the dangerous character of the product. (15) In these cases, however, the court often refuses to recognize any duty on the defendant to know of a small group of allergic consumers. (16)

Typical of this approach was *Singer v. Oken* (17) where the defendant had sold a calamine lotion for years without injury to anyone. Upon an express finding that the defendant had no reason to anticipate the plaintiff's injury, the court found for the defendant. This type of opinion, while speaking of allergy as a defense, has generally refused relief of a concrete lack of foreseeability. (18) The real problem occurs where, as in *Kinkead v. Lysol, Inc.*, (19) the courts rule that the defendant did not, as a matter of law, have to anticipate an injury produced solely because of the allergy. Such rationale puts the defect, as a matter of law, in the plaintiff rather than the product. However, since the plaintiff's injury was the only one ever reported, here again the problem seemed really to be one of foreseeability. (20)

Gerkin v. Brown & Sehler Company (21) is the foundation case for the opposite approach to the problem. Here plaintiff was injured by a reaction to the dye in a fur collar. There was evidence that the jobber was aware of this reaction in some people. No warning was given. The court held for the plaintiff, declaring that once the defendant had knowledge of a concealed danger in the product, even though it would injure only a few, he was under a duty to warn.

This same line of reasoning was carried forward in *Arnold v. May Department Stores*, (22) where the court simply held that a reasonable man would warn of hidden danger in his product, even a danger which is an allergic reaction, if he has knowledge of the danger. Similar reasoning has been applied in New Jersey (23) and Massachusetts. (24)

Extreme case requires warning

The most extreme case requiring a warning is the 1958 decision in *Braun v. Roux Distributing Company*. (25) The injury was a very rare disease known as "periarteritis nodosa." The plaintiff's doctor testified that it was caused by the paraphenylenediamine in the hair dye. There had never been a reported or recognized case of periarteritis nodosa caused by paraphenylenediamine before, yet the defendant was held negligent in not giving a warning to the plaintiff. After remarking on evidence of 23 medical articles concerned with the dangerous qualities of paraphenylenediamine, the court stated that the defendant was held to the skill of an expert in his business and was bound to keep reasonably abreast of scientific knowledge in his field, being charged with whatever knowledge he could have acquired. Though questionable on the facts presented, this decision does give an indication of the degree to which at least one present-day court is willing to depart from the old common law rule.

It is submitted that the major problem in this area is one of unforeseeability rather than that of allergy being a complete defense. (26) With the advances and dissemination of medical knowledge regarding

allergic reactions, the manufacturer is now in a better position to discover in his product any latent dangers to the allergic consumer. Likewise, the plaintiff's attorney is now in a more favorable position to present a strong case showing negligence. It would therefore seem reckless, given the proper set of facts, for a manufacturer to put sole reliance upon the allergy defense. One writer has stated:

What the same courts (those now holding allergy as defense) would do if faced with a clean-cut allergy that was (1) severe, (2) shared by a substantial proportion of people, (3) known to exist, and (4) traced to an ingredient in the defendant's product, cannot be taken for granted. (27)

A requirement of warning may be considered bad for business, but if indicated to be necessary by available technical information, it provides a safeguard for the liability-conscious manufacturer as well as the endangered consumer.

"Knew or should have known"

Since the requirement of a warning by a manufacturer is grounded on his having knowledge, actual or implied, of a hidden danger to a known class of allergic consumers, it is important to determine exactly when the manufacturer is said to have such knowledge and to be thereby put on notice. No precise rule can be given other than that of "the reasonable man in like circumstances." Each case will vary with the facts.

In *Wright v. Carter Products*, (28) there was evidence of 373 complaints out of 82 million jars sold in four years. The trial court held that the small number of users with adverse effects did not impose a duty on the defendant to warn. On appeal the United States Court of Appeals for the Second Circuit reversed. (29) The court noted a finding of the Federal Trade Commission that the product would cause dermatitis in some people and that the defendant with this knowledge continued to advertise the product as "safe" and "harmless." In remanding, the court stated that the evidence was sufficient to show knowledge on the part of the defendant as to the dangerous qualities of the product. Further, the defendant was under a duty to warn even the few who he knew would be injured. (30)

In a New York opinion, (31) the trial court had imposed a duty to warn of dermatitis where the defendant's own tests showed that about 7 per cent of the users of the product had suffered irritation. Reversed on appeal, (32) it was ruled that mere irritation on the part of a small percentage of people is not sufficient to put the defendant on notice of the possibility of dermatitis.

It can generally be said that the manufacturer will be under no liability for mere irritation, but liability is more likely where there is an actual allergic injury. (33) According to the *Braun* case, cited above, a duty to warn may be imposed where the specific reaction is not known but the general dangerousness of the product is known.

It would seem fair to conclude that the courts are going to require greater efforts on the part of the manufacturer to keep up with the developments in his own field, especially in light of the greater po-

tential for harm now existent through the use of newer and more potent chemicals.

In *Arata v. Tonegato* (34) the plaintiff refused to take a patch test at the defendant's beauty shop before an application of hair tint. She suffered allergic injuries. The appeal court affirmed a lower court verdict for the defendant on the ground of contributory negligence, holding that where a manufacturer has prescribed a patch test, it cannot be held liable for an injury caused solely by the failure to take it.

Contributory negligence as defense

The question of contributory negligence also arose in *Wright v. Carter Products*, (35) where the plaintiff had used the product for five years without trouble until a rash broke out under her armpit. She discontinued its use for seven months and the rash went away, but a later resumption of use resulted in a severe case of "contact dermatitis." In an action of negligence for failure to give a warning, the lower court ruled for the defendant on grounds of allergy. The court also stated that the plaintiff was guilty of contributory negligence by resuming the use of the product after the first irritation.

On appeal, the circuit court reversed on the duty to warn; (36) as to contributory negligence, it was stated:

The plaintiff cannot be said to have assumed a risk of which he was ignorant or to have contributed to his own injury when he had no way of reasonably ascertaining that the danger of injury existed. (37)

This same reasoning has been put forth elsewhere, and it appears acceptable in logic that contributory negligence be held inapplicable where the defendant's breach of duty is based on a failure to warn. (38)

These two decisions accentuate the hazards of a failure to provide a warning; the plaintiff's actions in the latter case might readily have been deemed contributory negligence if the product had borne even a simple warning legend regarding the possibility of allergic reaction. (39)

Compliance with FDA regulations evidence of due care

In *Phillips v. Roux Laboratories*, (40) the only reported case found where the adequacy of a preuse test has been assailed, the plaintiff took the usual 24-hour patch test (41) and, on finding no reaction at the end of that time, applied the hair dye from which injury resulted. At trial, the plaintiff introduced expert medical testimony to the effect that observations of delayed reactions may take from 72 hours to as long as one week. However, the defendant's evidence of correspondence from the Food and Drug Administration approving the patch test under the federal power to regulate coal-tar hair dyes, was denied admission. (42) The jury returned a verdict for the plaintiff.

On appeal, the verdict was reversed on the grounds that the correspondence should have been received in evidence:

Just as failure to comply with a statute and regulations promulgated thereunder is evidence of negligence, full compliance therewith is some evidence of the exercise of due care in preparing and publishing instructions for the guidance of consumers in the

use of hair dye preparations containing a coal-tar product. (43)

Hence, to the extent of its evidentiary value, a statute which requires a warning may provide protection to those manufacturers who comply with it. (44)

Conclusion

It has been suggested that the mere existence of a warning on a product may serve as an admission against a manufacturer in that it presents evidence that he knew his product would injure someone. (45) The commercial undesirability which naturally attains from the stigma of the warning placed on a product offered for sale in the market place presents additional valid objections. In juxtaposition to these considerations, we have the unquestionable need to provide full and complete protection to the consumer. It is evident that there is no easy solution here.

Experience with the warnings required on a coal-tar hair dye by Section 601(a) of the Food, Drug, and Cosmetic Act has shown that a warning can be devised which conveys the message of danger to the allergic. (46) By requiring all products of a certain class to be labeled with a similar warning it would partially negate arguments of unfair competitive advantages. But this effect could be assured only through legislation similar to the coal-tar dye legislation.

There have been presented a number of carefully reasoned solutions to the problem of the allergic consumer. (47) However, this problem seems basically to be the conflict between "settled" law established in a less-enlightened time and new concepts of science and new knowledge of advanced technology. Thus, economic rights built upon the old law are threatened by newly discovered social interests. (48) It seems certain, in one way or another, that the social interests will prevail.

It is submitted that the well-established tort concept of foreseeability is the only practical solution to the problems of liability for allergic injury. Since the fact of knowledge of the danger is the pivotal point of the doctrine, its application has the needed flexibility to incorporate new knowledge. While the court in the allergy case should receive evidence of knowledge of probable harm to a certain class of people, it should weigh such evidence with proofs of adequate warnings or other precautions which show due care under the circumstances. In this way all the facts will determine the result of the suit rather than the single fact and defense that the plaintiff was allergic.

References:

1. See annotations, 26 A. L. R. 2d 963, 966, 973 (1952); Dickerson, *Product Liability and the Food Consumer* (1951), pp. 216, 220.
2. *Bonowski v. Revlon*, CCH Food Drug Cosmetic Law Reports ¶22,635 (Iowa).
3. As to possible liability in food cases, see Strichartz, "Allergy and Food Products Liability: *Damnum Absque Injuria?*" 10 *Food Drug Cosmetic Law Journal* 408 (July, 1955); Dickerson, work cited at footnote 1, at p. 216.
4. See in particular Horowitz, "Allergy of the Plaintiff as a Defense in Actions Based upon Breach of Implied Warranty of Quality," 24 *Southern California Law Review* 221 (1951), and Dickerson, work cited at footnote 1, at pp. 225-227. See also Barsch, "Allergies and the Law," 10 *Brooklyn Law Review* 363 (1941); Cady, "Cosmetics and the Allergic Consumer: A Medicolegal Synthesis," 8 *Food Drug Cosmetic Law Journal* 701 (November, 1953); comment, 49 *Michigan Law Review* 253 (1950).
5. For examples, see *Wright v. Carter Products*, CCH Food Drug Cosmetic Law Reports ¶22,486, 244 F. 2d 53 (CA-2, 1956); *Reynolds v. Sun Ray Drug Company*, CCH Food Drug Cosmetic Law Reports ¶22,110, 135 N. J. L. 475, 52 A. 2d 666 (1947).
6. Horowitz, work cited at footnote 4, at pp. 224-227.
7. Horowitz, work cited at footnote 4.
8. See, generally, for a discussion of allergy and its medical aspects, Cooke, *Allergy in Theory and Practice* (1947). For a short discussion, see Horowitz, work cited at footnote 4, at pp. 224-227.
9. Horowitz, work cited at footnote 4, at p. 224.
10. Horowitz, work cited at footnote 4, at p. 226.
11. See annotations, 26 A. L. R. 2d 973 (1952); Dickerson, work cited at footnote 1, at p. 224.
12. CCH Food Drug Cosmetic Law Reports ¶22,456, 236 F. 2d 62 (CA-5, 1956).
13. *Levi v. Colgate-Palmolive*, 41 New So. W. St. 48, 58 New W. W. N. 63 (1941).
14. It has been contended that many allergy cases have been in reality decided on foreseeability rather than on the allergy defense (Dickerson, work cited at footnote 1, at p. 224; Horowitz, work cited at footnote 4, at pp. 230-232).
15. *Briggs v. National Industries*, CCH Food Drug Cosmetic Law Reports ¶22,183, 92 Cal. App. 2d 542, 207 P. 2d 110 (1949).
16. *Bennett v. Pilot Products Company*, CCH Food Drug Cosmetic Law Reports ¶22,262, 120 Utah 474, 235 P. 2d 525 (1951); *Merrill v. Beaute Vues Corporation*, CCH Food Drug Cosmetic Law Reports ¶22,459, 235 F. 2d 893 (CA-10, 1956).
17. 193 Misc. 1058, 87 N. Y. S. 2d 686 (1949).
18. See concurring opinion in *Merrill v. Beaute Vues Corporation*, cited at footnote 16.
19. 250 App. Div. 832, 296 N. Y. S. 461 (Memo.) (1937).
20. Folio 403 of the appeal record in *Kinthead v. Lysol, Inc.*, as reported in *Barsch*, work cited at footnote 4, at p. 370.
21. 177 Mich. 45, 143 N. W. 48 (1913).
22. 337 Mo. 727, 85 S. W. 2d 748 (1935).
23. *Reynolds v. Sun Ray Drug Company*, cited at footnote 5; *Ziropola v. Adam Hat Stores, Inc.*, 122 N. J. L. 21, 4 A. 2d 73 (1939).
24. *Bianchi v. Denholm and McKay Company*, 302 Mass. 469, 19 N. E. 2d 697 (1939).
25. CCH Food Drug Cosmetic Law Reports ¶22,539, 312 S. W. 2d 758 (Mo., 1958).
26. The same argument is made for breach-of-warranty cases (*Horowitz*, work cited at footnote 4).
27. Dickerson, work cited at footnote 1, at p. 224.
28. CCH Food Drug Cosmetic Law Reports ¶22,457 (DC N. Y., 1956).
29. Cited at footnote 5.
30. See *Cohen v. Procter & Gamble Distributing Company*, CCH Food Drug Cosmetic Law Reports ¶22,441, 18 F. R. D. 301 (DC Del., 1955).
31. *Lehner v. Procter & Gamble*, CCH Food Drug Cosmetic Law Reports ¶22,388, 206 Misc. 1103, 136 N. Y. S. 2d 121, 132 (N. Y. City Ct., 1954).
32. CCH Food Drug Cosmetic Law Reports ¶22,446, 208 Misc. 186, 143 N. Y. S. 2d 172 (N. Y. S. Ct., 1955).
33. See concurring opinion of Judge Wade in *Bennett v. Pilot Products Company*, cited at footnote 16.
34. 152 Cal. App. 2d 837, 314 P. 2d 130 (1957).
35. Cited at footnote 28.
36. Cited at footnote 5.
37. 244 F. 2d 61.
38. Dillard and Hart, "Product Liability: Directions for Use and the Duty to Warn," 41 *Virginia Law Review* 145, 163 (1955).
39. See *Taylor v. Jacobson*, CCH Food Drug Cosmetic Law Reports ¶22,528, 336 Mass. 709, 147 N. E. 2d 770 (1957), as to breach-of-warranty action where plaintiff lost because she did not comply with patch-test instructions.
40. CCH Food Drug Cosmetic Law Reports ¶22,425, 286 App. Div. 549, 145 N. Y. S. 2d 449 (1955).
41. The user is directed to wash an area about the size of a quarter on the inner fold of the elbow or behind the ear and extending partly into the hairline. The area is dried and test solution applied. The test area is to be left uncovered and undisturbed for 24 hours. The user is then to examine the area within the next 24 hours; if the result is negative, the dye is to be applied immediately.
42. 21 USC Sec. 361 (1952).
43. Cited at footnote 40.
44. See also *Merrill v. Beaute Vues Corporation*, cited at footnote 16 (approval of FDA and AMA of some weight); *Bish v. Employers Liability Assurance Corporation, Ltd.*, cited at footnote 12 (approval of FDA and AMA presents inference of safety).
45. *Barsch*, work cited at footnote 4, at p. 376; Strichartz, work cited at footnote 3, at p. 423.
46. 21 USC Sec. 361 (1952).
47. See Cady, work cited at footnote 4, at p. 704, for a list of suggested solutions made in the course of time.
48. See Dillard and Hart, work cited at footnote 38, at p. 179.

HAIR PREPARATIONS HEAD CANADIAN SALES;

Dentifrices Are Second, 95% of Firms Report

Sales of toilet preparations in Canada during 1959 totalled \$145,323,955, according to data filed with the Dominion Bureau of Statistics.

The report, just released, covers nearly all major Canadian manufacturers and distributors of toilet preparations. With 68 firms reporting, the Bureau estimates this group accounts for at least 95% of all toilet preparations sales in Canada. Sales were reported on a suggested-retail-selling-price basis.

Hair preparations head the list and are valued at \$24,757,736. Dentifrices are second with a retail sales value of \$21,318,216. Other large sellers include: shampoos, \$10,630,407; colognes and toilet waters, \$9,179,249; and lipsticks, \$8,431,898.

A complete breakdown follows:

Product	Value of Sales	Product	Value of Sales
Bath salts and bath oils	\$ 1,822,445	Make-up bases	2,036,598
Bubble bath	1,143,314	Manicuring preparations—	
Creams, cleansing	3,816,018	Nail enamels	1,681,710
Creams, hormone	558,184	Nail polish remover	335,189
Creams, night	4,701,189	Other manicuring preparations	249,022
Colognes (except solid) and toilet waters	8,786,773	Mouth washes (oral antiseptics)	1,850,206
Colognes, solid	392,476	Perfumes	6,493,751
Dentifrices—		Powder, face—	
Aerosol	812,011	Compressed	3,272,264
Pastes	19,754,197	Loose	1,542,525
Powders	737,495	Powder, dusting and talcum	
Liquid	14,513	(excluding after-shave talc)	5,911,615
Deodorants (personal) and anti-perspirants—		Rouge	719,358
Spray	720,653	Shampoos—	
Cream	1,607,644	Soap	3,612,995
Solid	1,587,970	Soapless	7,017,412
Liquid	4,052,209	Shaving preparations (except soap):	
Depilatories (personal)	254,695	After shave lotions	3,563,248
Eye make-up	3,246,936	Other shaving preparations	
Foundations—		(including after-shave septics, after-	
Cream	1,461,476	shave talc, beard softeners, etc.)	1,210,461
Liquid	1,473,425	Shaving soaps—	
Hair preparations (excluding shampoos):		Aerosol	889,245
Hair sprays (aerosol fixatives)	4,329,733	Lather type (creams)	2,389,418
Hair tonics and dressings	9,919,664	Brushless type (creams)	525,210
Home permanents	6,408,202	Other (cakes, sticks, etc.)	431,148
Rinses, tints and dyes	2,677,184	Sunscreen preparations	1,162,007
Other	1,422,953	All other toilet preparations (excluding	
Lipsticks	8,431,898	toilet soap) not enumerated above	3,425,821
Lotions, face, hand and body		TOTAL	\$145,323,955
(excluding shaving preparations)			
Liquid	5,640,084		
Solid	1,231,411		

New Technique Modifies Warburg Flask

By MERVYN J. HUSTON, Dean, School of Pharmacy, University of Alberta

Standard Warburg methods for the *in vitro* study of tissue respiration involve suspension of the tissues in a fluid medium. Many different solutions have been used and since quite different respiratory values are obtained, it is difficult to know which, if any, represents the *in vivo* condition. The uncertainties of the physiologic picture complicate the interpretation of pharmacologic investigations. Also, a drug which may produce a significant effect on the intact animal may be so diluted or modified when the tissue is placed in the fluid medium that little or no effect can be observed. Cellular effects demonstrated by the addition of drugs to the suspension medium may not represent the *in vivo* response either quantitatively or qualitatively.

Huston and Martin (1) have shown that tissue respiration can be satisfactorily measured with the tissue suspended in oxygen on fiber-glass mats. This method avoids variabilities due to the effect of the suspension liquid and may therefore more nearly represent the *in vivo* situation. This technique has been successfully applied to pharmacologic studies (2-5).

Design of flask

When an attempt is made to study tissues placed directly in a gas phase it is necessary that the tissue be spread out flat to assure adequate diffusion of the

gas to all parts. Huston and Martin (1) accomplished this by placing the slice of tissue on a fiber-glass mat in a specially designed wide-mouthed flask. It is the purpose of this paper to describe a modification and simplification of their flask.

In the Huston-Martin flask the mat and tissue were placed on a rotatable paddle. This paddle was made rotatable so that the mat and tissue might be dropped into a solution in the tray beneath. This would be desirable for two types of experiment: (a) for measurement of the R.Q. by the second method of Dickens and Simer (6) and (b) to test the effect of dilution on drug action. However, in experiments involving the direct method of Warburg the paddle is not necessary and a simpler method of suspension is possible. Also, a delivery side arm is not necessary since the drugs will be administered to the intact animal.

The proposed flask was prepared by Fisher Scientific Company and is pictured in Figure I. It consists of a wide-mouthed flask, of approximately 19 ml. capacity, which can be attached to a standard manometer by means of a glass adapter. The flask contains a removable tray with short legs. The sides of the tray flange inward at the top to support the fiber-glass mat. In carrying out an experiment using the direct method of Warburg the potassium hydroxide solution is placed on a small piece of filter paper on the bottom of the flask.

A small quantity (usually 1.5 ml.) of a suitable Ringer's solution is placed in the tray to maintain the humidity in the flask. The tissue slice, supported by a disc of fiber-glass, is placed on top of the tray.

This method eliminates the necessity for expensive shaking apparatus since the tissue is in contact with the gas and does not obtain the oxygen from solution in a liquid medium.

The versatility of the flask is to be noted in that the tissues can be placed in the liquid in the tray if standard Warburg methods are desired. The wide mouth of the flask facilitates the placing of the tissue in the fluid and there is no danger of contact with the potassium hydroxide.

References

1. Huston, M. J. and Martin, A. W.: Proc. Soc. Exper. Biol. Med., 86, 103, 1954.
2. Huston, M. J. and Martin, A. W.: Arch. int. pharmacodyn., 101, 349, 1955.
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4. Moore, K. E., Murray, J. R. and Huston, M. J.: *ibid*, 118, 340, 1959.
5. Zelmer, J. E. and Huston, M. J.: Can. Pharm. Jour. 93, 6, 42, 1960.
6. Dickens, F. and Simer, F.: Abderhalden's Handbook, 1933, Abt. IV, Teil 13, 435 ff., Springer, Berlin.

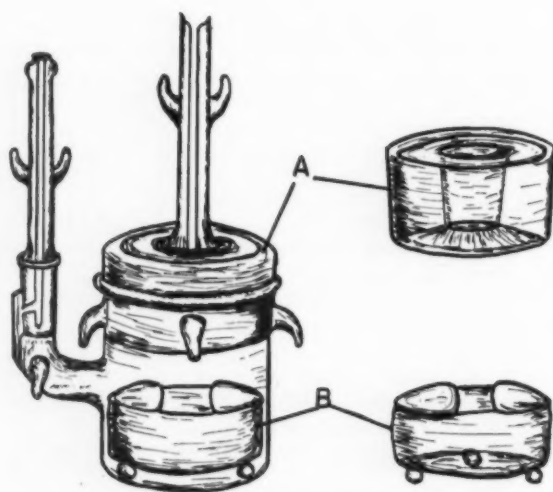


Fig. I

A. Adapter to attach vessel to standard manometer. B. Removable tray.

General Comments on Warburg Techniques

September 21, 1960

Dean M. J. Huston
Faculty of Pharmacy
University of Alberta
Edmonton, Alberta, Canada

Dear Dean Huston:

It is with considerable interest that I have read your article in the Scientific Section of the Canadian Pharmaceutical Journal for August regarding the new flask for tissue respiration studies.

In an article which we are going to publish soon, the author uses minced young mouse skin that is free from hair, claiming that using tissue slices is fraught with variables such as variation in tissue slice, surface exposed,

manner of exposure, penetration of oxygen and so forth. We would like to have your observations in this regard.

Secondly, there seems to be considerable difference of opinion regarding the degree of accuracy the Warburg technique allows. Furthermore, there seems to be quite a variable in the individual work of authors in reporting oxygen absorption.

Finally, there are some mentions in the literature of the depression of skin respiration by various materials applied to the skin, such as are commonly used in cosmetics but no figures have been published on this score. Has any of your work shown such data in tabulated, numerical form?

Cordially,

M. G. deNavarre

University of Alberta
Faculty of Pharmacy
Office of the Dean

October 5th, 1960

Mr. M. G. deNavarre,
Editorial Director,
American Perfumer

Dear Mr. deNavarre:

Thank you for your letter and your interest in my paper on the new flask for tissue respiration studies.

The questions raised in your letter have been and still are the subject of considerable unresolved debate. In any experimentation involving living material there is a biological variation and also differences due to techniques, skills and methods of recording and reporting. Obviously this applies to tissue respiration studies. Each experimenter stoutly maintains that his procedure is the best. Or putting it in a more kindly way, each investigator selects the methods he feels is the most appropriate for his work. Interpretations of any report must be made in the light of the experimental procedure.

In Warburg work, as in any other *in vitro* experimentation, the charge can be levelled that this is not a natural situation. This is true and it cannot be otherwise. Each person therefore adjusts this artificial condition in a way he thinks most nearly approximates normalcy so that his results will be meaningful.

Tissues are prepared in various ways for respiration studies, such as, whole organs, slices, minces, homogenates and extracts. Each has a utility. It is true that variation in the thickness of slices influences oxygen utilization. If the slice is too thin a high proportion of the cells will be damaged; if it is too thick there will be a limited access

of oxygen. The skill of the operator is a factor in cutting such slices and this is one reason why we usually use a Martin slicer. However, such variations may not nullify an experiment since results will be relative to a control. The absolute values might differ but an experimental effect might be evident. This is a poor second best and sounds a bit thin I must admit.

The author to whom you referred who worked with minced young mouse skin may well have used the most satisfactory way of handling the tissue for his purposes. (Although I shall mention later a way that might have been better). However, no matter what one does to a tissue one may be criticized for having done it since the tissue has been changed in an arbitrary and variable way from normalcy. In other words, his mince is as vulnerable to criticism as someone else's slices. Presumably he thinks the mince is best. He should think so or he should be using something else.

Another factor that causes as much, or more, variation in results as the handling of the tissue is the nature of the solutions used. For example, Bertalanffy and Pirozynski (Biol. Bull., 1953, 105, 240) have expressed concern over variations introduced by different media amounting to 2- to 3-fold. This is one of the reasons that lead us to propose our modification in which the tissue is suspended in the gaseous phase rather than a liquid medium.

Standard Warburg methods involve suspension of tissue slices, minces, homogenates, etc., in volumes of suspension fluid greatly in excess of the volume of the tissues. Many different solutions have been used with the aim of approximating the milieu interieur so that the rates of respiration obtained might represent those in the intact animal. Quite different values are obtained with different solutions and it is difficult to know which, if any, represents the *in vivo* condition. Since suspension of tissues in a liquid results in dilution of metabolites to a level below the

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optimal extracellular fluid level, Krebs and others have proposed media which makes a partial restitution of these metabolites. However, these solutions cannot compensate for all the many materials to be found in the cells of living tissues. On the other hand, the added material might stimulate the rate of respiration beyond the normal *in vivo* rate. The uncertainties of the physiologic picture complicate the interpretation of *in vitro* pharmacologic investigations. Furthermore, a drug in a quantity which may produce a significant effect on the intact animal may be so diluted when the tissue is placed in a Warburg vessel that little or no effect can be observed.

The procedure of placing the tissue on fiber-glass mats in the gaseous phase removes the above disadvantages. The apparatus described in the Canadian Pharmaceutical Journal, Scientific Section is a modification of our original flask (Huston, Martin, Proc. Soc. Exper. Biol. & Med. 1954, 86, 103-107). We have found the flask satisfactory in our laboratory. We have considerable more experience with the original model and have used it successfully for pharmacologic experimental work (Huston and Martin, Arch. int. pharmacodyn., 1955, CI, No. 3, 349; Calvert and Huston, Arch. int. pharmacodyn., 1957, CXIII, No. 1-2, 45; Moore and Huston, Arch. int. pharmacodyn., 1959, CXVIII, No. 3-4, 340; Zelmer and Huston, Can. Pharm. Jour., 93#5:58-61 and No. 6:42-47, 1960). The limitations of the technique are (i) substrate or drug cannot be added to the tissue in the flask and (ii) the usual problems arising from any *in vitro* procedure.

It might well be that our technique could be used for work on skin. Possibly intact skin could be used and avoid the disruption of the functional integrity of the tissue by mincing. Also the drug applied to the skin would not be washed off by the liquid medium. However, this is "arm chair" science and therefore hazardous and it would have to be put to the test.

Why there is a variable

You comment that there seems to be quite a variable in the individual work of authors in reporting oxygen absorption (utilization). This is true. We usually report the oxygen used in mls. of oxygen per hour per gm. of wet weight. We use wet weight because the results then are relative to the state of the tissue as it occurs in the body and is therefore more physiologic than by dry weight or nitrogen. This is particularly pertinent in view of our procedure where the tissue is not in contact with exogenous fluid. However, other workers report in terms of dry weight or nitrogen content and stoutly maintain that this is the only sensible way to do it. They have valid arguments in support of their procedures but we feel the advantages of more physiologic reference outweigh the disadvantages. Again the results must be interpreted in the light of methods of procedure and reporting. Such variations in reporting of course are unfortunate since it is difficult to compare the work of one author with that of another.

You asked about any information I may have on skin respiration. I have not done such studies though I have been hoping to do some using our procedure and may yet get around to it soon. In our summated tissue calculations we used the figures reported by Field et al (J. Cell. & Comp. Physiol. 1939, 14, 143). I'm afraid I cannot help you much here.

It has been a pleasure to hear from you and I hope my comments may prove of some utility to you.

Sincerely,

M. J. Huston,
Dean.

American Perfumer



TECHNICAL ABSTRACTS

Factors Influencing The Tanning Effect Of Dihydroxyacetone On The Skin.

Nelson Kanas, John Buchter, and Fred J. Bandelin. Research and Development Division, Strong, Cobb, Arner, Inc., Cleveland, Ohio.

The effect of various vehicles on the tanning effect of dihydroxyacetone on the skin and the brown coloration resulting is investigated. Factors given consideration include concentration, solvents, pH and surfactants. Vehicles used include aqueous, alcoholic and hydroalcoholic solutions; water-in-oil and oil-in-water emulsions. The influence of these factors on the speed of reaction and the depth of color are recorded photographically and the results correlated with the factors involved.

Evaluation Of Hyprose Esters As Emulsifying Agents.

J. Autian and S. C. R. Chokhavatia. University of Michigan College of Pharmacy, Ann Arbor, Michigan.

A new series of surface active agents have been synthesized from sucrose having a range of HLB values. The parent compound in the series is identified with the name of Hyprose (octakis (2-Hydroxypropyl) sucrose-Dow Chemical Co.). These compounds are non-toxic and free from any objectionable taste. For these reasons a group of Hyprose esters were selected and evaluated as possible emulsifying agents in both oral and intravenous emulsions. The results of the experiments indicated that excellent emulsions could be achieved with certain oils, but on addition of other agents or changes in pH the stability was drastically reduced. Various tests were employed in the evaluation to discern the merits of the emulsions.

The Effect Of Various Surfactants On The Hydrophile-Lipophile Balance Of Acacia.

Wallace L. Guess. The University of Texas, College of Pharmacy, Austin, Texas.

The hydrophile-lipophile balance (HLB) of a non-synthetic emulsifier (acacia) has been determined in the presence of various ethylene oxide derivatives of sorbitan fatty acid esters. Another investigator has reported an HLB value for acacia, but it appears to be much too low for the formation of an oil-in-water emulsion. It was felt that perhaps the value reported could have been due to the particular surfactant used in the study by the previous worker. This investigation was undertaken to determine if a variation of a reference surfactant would cause a change in the HLB of a natural product such as acacia. The reference surfactants used in this study were the following polyoxyethylene sorbitan esters—monolaurate (Tween 20), monolaurate (Tween 40), monostearate (Tween 60) and monooleate (Tween 80). It was found that the effect of these surfactants on the HLB of acacia was negligible insofar as causing the HLB value to change and therefore the HLB value previously reported for acacia appears to be in error. More than one hundred mineral oil-water emulsions were prepared and the HLB value for producing oil-in-water emulsions was determined to be 11.8 for acacia, which is within the arbitrary range for producing this

type emulsion. Emulsions were also produced under a variety of conditions of agitation and it was found that the method of agitation had little or no effect on the HLB value of gum.

The Preparation And Evaluation Of Grapefruit Peel Tincture And Grapefruit Syrup.

N. H. Franke, H. M. Hutchinson, J. H. Hayes, B. B. Hunt, and J. L. Burge. Auburn University School of Pharmacy, Auburn, Ala.

A grapefruit peel tincture was prepared by maceration of the grated outer yellow peel of the fresh fruit. The determination of the oil content of the tincture was done by an adaptation of the A.O.A.C. precipitation method. A grapefruit syrup was prepared from the tincture using heavy magnesium oxide as the filtering agent. Organoleptic tests indicated that the syrup compared favorably in taste preference with five other vehicles, which ranked high in taste preference tests conducted by other workers. Grapefruit Syrup also appeared to have a high value in disguising the salty taste of ammonium chloride and a mediocre value in disguising the bitter taste of quinine hydrochloride.

The Preparation And Evaluation Of A New Kind Of Apple Syrup.

N. H. Franke, H. M. Hutchinson, J. H. Hayes, B. B. Hunt, and J. L. Burge. Auburn University, School of Pharmacy, Auburn, Ala.

An apple syrup was prepared from a newly developed commercially available, natural apple essence. Organoleptic tests indicate that although it does not compare favorably in taste preference with five other vehicles, which ranked high in taste preference tests conducted by other workers, it is preferable to the official Citric Acid Syrup. Apple syrup also appeared to have a relatively poor value in disguising the salty taste of ammonium chloride and the bitter taste of quinine hydrochloride.

Hydrogen Peroxide Formation by Zinc Oxide in Ointments.

By Hector Antonio Lozada and Earl P. Guth.

(Digested from DRUG STANDARDS, Volume 28, No. 3, May-June 1960)

Zinc Oxide is a frequently used ingredient for the treatment of dermatological conditions of a varied nature. A study is concerned with the formation of hydrogen peroxide by zinc oxide when incorporated into ointment bases. Chari and Qureshi in 1944 found that light up to 470 $m\mu$ was effective in causing the photochemical reaction, catalyzed by zinc oxide, to proceed. In their study Lozada and Guth used five bases to examine the formation of hydrogen peroxide. They were white ointment, Aquaphor, hydrophilic ointment, hydrous wool fat, and polyethylene glycol ointment. All the ointments except the latter were prepared using the U.S.P. procedure for zinc oxide ointment. The polyethylene glycol ointment was first dissolved in water and an aliquot of twenty-five ml. was used in the test. The ointments were placed in centrifuge tubes prior to irradiation and twenty-five ml. of either distilled water or sodium formate solution was added to the contents of each tube. The ultraviolet lamp was set up at a distance of eighteen inches from the top of the sample holder. The lamp, the sample holder, and a constant water bath were enclosed in an aluminum box. The iodometric method developed by Kolthoff (1) and later modified by Chari and Qureshi (2) was used for the quantitative determination of the hydrogen peroxide produced by the samples. Experiments were undertaken to prove the presence of an oxidized form of cholesterol after treatment with hydrogen peroxide. Thus, the oxidation of the cholesterol component naturally present could account for the low

peroxide values obtained with certain fixed oils. Peroxide was shown to be produced in considerable quantities when zinc oxide is incorporated into a white ointment in a relatively short period of irradiation if the system is at a temperature to liquify the vehicle. Only traces of peroxide were found in samples at temperatures under the fusion point, but quantities of peroxide increased ten-fold if the temperature was increased to 55°C. The liquid system of polyethylene glycol produced a high level of peroxide at all temperatures. Aquaphor or hydrous wool fat showed no appreciable residual peroxide. The analysis of the cholesterol content however showed that the cholesterol was oxidized at the hydroxyl group to form a ketone and that the peroxide would have to be determined by a different method. Infrared spectrographs and chemical tests confirmed the reaction and indicated a mixture was present containing both functions: the hydroxyl and the ketonic groups. There was some indication of the presence of a cortisone-like structure and action, consequently, cholesterol-containing ointment bases are not completely inert chemically under all conditions in which they might be used. It can be established from the results of this work that hydrogen peroxide is produced in all systems containing zinc-oxide-water-oxygen and activated by ultraviolet light.

- (1) Kolthoff, I. M. Z. *Anal. Chem.*, 60, 400 (1921)
- (2) Chari, N., and Qureshi, N, *J. Indian Chem. Soc.*, 21, 97, 297 (1944).

The Stability of Oily Cream B. P., E. W. Clark and G. F. Kitchen, from Westbrook Lanolin Co., Argonaut Works.

Oxidation of Wool Alcohols B.P. in stored Oily Cream B.P. is insignificant and does not affect the stability of the cream, but the method of preparation, and the amount of autoxidation in the wool alcohols used in making the cream, do affect stability. Storage of wool alcohols before use, as a mixture with Liquid Paraffin B.P. or Liquid Lanolin "60" (a solvent segregation product of Anhydrous Lanolin) greatly reduces autoxidation. Liquid Lanolin "60" also acts as an auxiliary emulsifier and imparts stability. Modifications to the official method of preparation are suggested. *Thru J. Pharm. Pharmacol.* 12, 4, 227 (1960).

Methods of Hair Removal and Cosmetic Management.

Thallium acetate has been used for the purpose of temporary epilation but since this drug has severe neurotic manifestations, it is not considered safe and is definitely not advised for the cosmetic removal of excessive hair. For the temporary removal of hair, either tweezing, clipping or shaving is adequate as long as proper hygienic measures are used before and after removing the hair. Tweezing hair in the vicinity of the body orifices should be performed with caution. Pumice should be used as long as a bland emollient is also included in the procedure. Wax applied to a washed skin is a method commonly used. It is acceptable as long as a bland antiseptic lotion is applied following the treatment. A bleaching solution containing hydrogen peroxide and ammonia renders hair less conspicuous. Chemical depilatories are of two main types—those containing barium or strontium sulfide are very effective and work

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in a few minutes after application. Other types are based on the use of substituted mercaptans in the presence of alkaline-reacting materials like calcium thioglycollate. Electrolysis and electrocoagulation result in the destruction of the papilla and are the successful and permanent methods of removing external hair. Radiation affects hair growth by interfering with mitosis. This method is not safe for cosmetic usage in that it has been found to produce irreversible skin changes because of the amount of radiation needed to destroy the hair follicle.

The Applications of the Infracord 137 to Product Control.

Mary Nebel and M. G. deNavarre, Cosmetic Laboratories, Inc., Detroit, Michigan.

Quality control procedures for the analysis of raw materials and finished products must be fast, reliable, and simple to perform. The Perkin Elmer Infracord Model 137 is used by this laboratory in the analysis of raw materials, to check the uniformity of perfume oils, to check the formulation of the fat phase of certain products, and in trouble shooting.

The fat phase of a product is checked through comparison of spectra of films or carbon tetrachloride solutions of the factory sample with a series of standard spectra and with the spectra of the individual raw materials. Since for the most part, only slight variations in the spectra of the properly and improperly formulated batch can be expected, use of carbon tetrachloride solutions in fixed cells affords closer control of sample thickness, but solubility problems and the danger of cell

damage due to wet samples limit the usefulness of this technique.

The uniformity of perfume oils is checked by comparing the spectra of various batches of a blend, but since most of these materials are complex mixtures of varying composition, no rigid standards can be established.

One raw material which can be analyzed quantitatively with infrared is the polyethyleneglycol monostearates. The saponification number and estimation of hydroxyl groups can be expressed in terms of absorbance units.

If a certain batch of a product fails to pass inspection, the infrared spectra of the solids can give information as to the cause of the trouble. In one instance a cream was found to have been made with the wrong emulsifier.

A preliminary report on the application of the Infracord 137 to product control has been presented and advantages and limitations of the procedures have been discussed. *Thru Scientific Seminar, Society of Cosmetic Chemists of Spain, Barcelona, Sept. 6, 1960.*

The Preparation And Evaluation Of Lime Peel Tincture And Lime Syrup.

N. H. Franke, H. M. Hutchinson, J. H. Hayes, B. B. Hunt, and J. L. Burge. Auburn University School of Pharmacy, Auburn, Ala.

A lime peel tincture was prepared by maceration of the grated outer green peel of the fresh fruit. The determination of the oil content of the tinctures was done by an adaption of the A.O.A.C. precipitation method. A lime syrup was prepared from the tincture, using heavy magnesium oxide as the filtering agent. Organoleptic tests indicated that lime syrup

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compared poorly in taste preference with five other vehicles, which had ranked high in taste preference tests conducted by other workers. Lime syrup also appeared to have a low value in disguising the salty taste of ammonium chloride and the bitter taste of quinine hydrochloride.

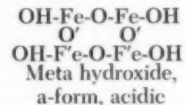
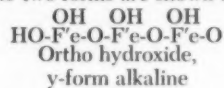
Iron-Carbohydrate Complexes. S. T. Ali Naqvi, S. A. Rizvi, S. Mahdihassen.

Iron preparations used orally have their limitations due to hyposecretion of the gastric juice, irritability of the stomach or intolerance by the intestine. When quick and sure results are desired no better form of administration can be suggested than the parental route. Today there are iron preparations for intravenous as well as intramuscular administration. It was therefore considered desirable to undertake a study of their formation.

Nissim and Robson (1) were practically the first to show, how saccharated iron oxide for intravenous use can be safely prepared. Commercial firms, who have followed this method, have contributed to the demand of the physician without adding much to the scientific literature on the subject. However, there has been one exception, Schwietzer (2). Since he has gone into full details explaining the constitution of saccharated iron oxide, it is proposed here merely to expand the data incorporated in his paper which saves our entering into any theoretical discussion.

Iron chloride of standard B.P.-quality was used as an aqueous solution containing about 5% elemental iron and another solution with 10% iron. To these were added calculated amounts of 20% sodium carbonate solution allowing an excess of alkali to give a pH 8. When the two solutions are mixed quickly, vigorous foaming starts and the resultant product assumes a pale yellow ochre colour. This is the a-form, or ferric meta-hydroxide to which

Krause has attributed a constitution given below, being reproduces from Mellor's textbook (3). When the same solutions are so mixed that more heat develops the formation of another form is induced, further accelerated by vigorous stirring while mixing. It has a red-brown colour same as burnt sienna, well-known to artists. It is distinguished as the y-form, or ferric ortho-hydroxide. The two forms are shown below:



It is well-known that the y-form easily produces ferrites when heated with sodium hydroxide solution. It is again the same form which gives complexes with carbohydrates. Having used different starting materials, all labelled, iron chloride, B.P.-quality, we find there was nevertheless a difference between them. Some gave the ideal red brown colouration of the y-form while others are appreciably deeper in colour; the final products which were prepared after further processing differed consequently but only in colour and not in solubility. On the contrary, different supplies of cane sugar did not reveal any noticeable variation in the final product on that account.

The Chemistry of Bacterial Cell Walls.

A brief and selective summary of more recent contributions concerning the chemistry of bacterial cell walls is given. Muramic acid, as first isolated by Strange, has been synthesized and separated into its diastereoisomers. Muramic acid as isolated from highly purified cell wall hydrolysates has been found to be identical with 3-O-

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D-lactyl-D-glucosamine, M.p. 155° (a) $\frac{25^{\circ}}{D} = + 123,0^{\circ}$ (equilibrium rotation). Additional, biological evidence for the aminosugar configuration of Muramic acid has been found with (1-C¹⁴) labeled β -Methyl-N acetyl-D-glucosaminide. *L. bifidus* var. *pennsylvanicus* incorporates the latter specifically and quantitatively into cell wall muramic acid. Neuraminopeptides have been isolated from culture medium of *E. coli* K 235 L+O and are compared with the repeating cell wall unit of gram-positive microorganism. A preliminary proposal of the repeating unit of the cell walls of gram-positive microorganism is discussed. *Arzneimittel-Forschung* 11, Nov, 1959 pp 667.

Production of Essential Oil in U.S.S.R.

By N. Jakobachvili.

(Digested from *LA FRANCE*, Volume III, No. 16, June, 1960)

In the time of tsarist Russia, the cultivated fields dedicated Essential Oils were of 9,000 hectares. There were only cultivated: Coriander, Mint, Aniseed, Fennel, and Thyme.

Today, we cultivate in U.S.S.R. about thirty varieties of plants for volatile oils, among which a few are from tropical or subtropical origin. Forty-two factories are provided for the treatment of plants, and dispose of a very modern technical equipment. They produce more than 23 varieties of oils.

The production of coriander oil comes to the first place (8 K° per ton of seeds). The treatment of same has become more modern, thanks to the use of a con-

tinuously running machine (Ponomarenko and Pokolenko) which will be described.

As for the jasmin, the experimental station of Soukhoumi uses the method of dynamic absorption, based on the fact that in jasmin flowers, the oil can be collected and then released in some determined conditions. This process will be described.

For geranium, as for lavender, mint clary sage, basil, we use successfully a continuous machine (Revazov and Moskalev), the principles and performances of which will be described.

The treatment of distilling waters containing volatile oils is put into practice in U.S.S.R. through the method of continuous cohobation or absorption, of which the extractive outputs are similar.

In accordance with the continuous growth of the material and cultural prosperity of the U.S.S.R. workers, the population puts of an increasing demand for perfumery and cosmetics, from which results a systematic development of the production of perfumery and cosmetics sectors, which brings in its turn a more important request for essential oils.

A Note on Autoxidation and Its Inhibition in Wool Alcohols B. P., E. W. Clark and G. F. Kitchen, from Westbrook Lanolin Company, Argonaut Works.

The effects on Wool Alcohols B.P. of gradual autoxidation during storage at room temperature have been compared with the known effects of accelerated oxidation. There is a decrease in emulsification value, a bleaching of the surface, and, contrary to previous reports, a rapid fall in melting point. Autoxidation, even under bad

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conditions, has been inhibited, apart from a slight fall in melting point, for at least 23 months by the addition of 500 p.p.m. of butylated hydroxyanisole, but certain other antioxidant systems had only a limited effect. *Thru J. Pharm. Pharmacol.* 12, 4, 233 (1960).

Mechanismus und Norm Der Thermischen Wirkung Verschiedener Emulsionstypen Auf Der Haut, Prof. Dr. Dr. Heinz-Egon Kleine-Natrop.

In the last ten years interest has again been concentrating upon the physical effects accompanying the external application of pharmaceutical preparations in the local treatment of the skin. These activities—which resume the classical chemotherapeutical tradition established by Unna—have been stimulated particularly by the increasing knowledge about the physiology of the skin surface—and this physiology, beside pharmacology, is the starting point of a rational local treatment with pharmaceutical preparations. Attention has always been devoted to the thermal effects accompanying certain types of such preparations, in particular water/oil and oil/water emulsions. If an emulsion of room temperature is applied to the skin—whose temperature is normally higher—there is at first some temperature exchange connected with a short-time reduction of the skin temperature. This effect is comparatively independent of the type of emulsion and may be modified by pre-cooling or pre-heating the preparation in question. This exchange is followed by the proper thermo-effect.

Water/oil emulsions containing no active principles, the effect is characterized by temperature elevation, while oil/water emulsions afford a temperature decrease. The different effects due to the two types of emulsion may be explained by the fact that the temperature elevation normally connected with the application of the coating is offset by better thermal conductivity and by the heat consumed in evaporation; for some time there may even be a complete reversal. This effect is more lasting than the exchange effect and on the average vanishes only after about 30 minutes. If suitable graphical and statistical schemes are chosen to compare the temperatures observed after application of the emulsion with those of the free skin it is seen that the temperatures observed remain within the normal range of dispersion of the normal skin temperature; however, this region is narrowed by water/oil emulsion in favour of the higher, by oil/water emulsions in favour of the lower temperatures. *Thru Parfumerie und Kosmetik*, 41 Jahrgang, 3, March 1960, page 102.

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PACKAGING & PROMOTION



1

1—Coty

Harmony in Color, Coty's new lipstick and nail polish promotion, is based on the concept of harmonizing nails and lips to complexion and costume. Highlight of the promotion is a special consumer offer, Coty "24" lipstick and "Super-Sheen" nail enamel both for \$1.50—a regular \$2.00 value. Merchandise is carded and each card unit is its own display, giving full details of the offer, as well as the concept of coordinating make-up.



2

2—Breck

A new one and one-half ounce bottle has been introduced by John H. Breck Inc. for the packaging of its three customized shampoos. The new package was placed on the market banded to a Breck carton containing a four ounce bottle of shampoo. Consumers were offered this 90 cent value for 60 cents. The new smaller package is priced to retail at 30 cents. The combination package contains a premium offer of a record album.

3—Mennen

Both tube and carton of Mennen shaving cream products have been modernized by simplifying the design and incorporating the new Mennen corporate logo into the format. The color combination is blue-green and green on a new type of white glossy finished board. The tube has also been revised to include a new conical shaped cap.



3

4—Prince Matchabelli

Prince Matchabelli introduces Tact, the first stick deodorant that is also an anti-perspirant. Tact is a core stick, made up of a lotion-type inner core surrounded by a sleeve of a light blue alcohol-based deodorant. The inner core is the anti-perspirant. The stick is packaged in a light-weight yellow plastic case.



4



5



6

5—Yardley

The introduction of a special, jumbo size shaving foam spearheads the Yardley of London 1961 men's toiletries promotion program. The 11 ounce size retails for \$1.25. The jumbo edition features a new black stack cap, but is otherwise identical in design to the regular package. To attract attention at the point of sale, Yardley is offering retailers a self-service counter display holding eight units of the special size.

6—Wrisley

The Allen B. Wrisley Company has added a bath powder to its French Lilac line. This new product joins French Lilac spray mist cologne, bubble bath and fragrance bath soap. The container matches the packaging of the rest of this popular line.

7—Rubinstein

Helena Rubinstein has introduced Coverfluid, a new moisturizing French formula make-up. Its use results in a translucent, matte finish that gives a soft, natural look to the complexion and can be worn with or without matching face powder. Packaged in a white plastic tube, the gold cap removes to form a cradle for convenience of use. It is available in seven shades.

8—Max Factor

A special Springtime fragrance promotion is being scheduled by Max Factor that will feature two combination offers of his most popular fragrances—Hypnotique and Primitif. Each offer will consist of a 3 ounce bottle of spray mist cologne packaged together with a handy purse size vial of matching perfume and will be priced at \$3.00, plus tax, which is the regular price of the cologne alone. Particular emphasis is being placed on these special fragrance combinations as appealing gifts for Valentine's Day, Easter, and Mother's Day.



7



8



PACKAGING & PROMOTION



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7



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New Products

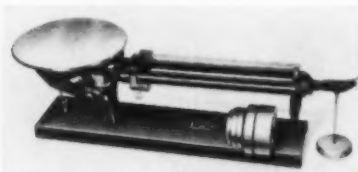
Particle size distribution counter

Substantially simplified rapid particle size determination with a high degree of reproducibility is now available. It is a giant step forward in ease of operation for particles, ores, minerals emulsions, foods, slurries, liquid or air contaminants, abrasives, pigments and numerous others. Particle range of the new counter extends from below 1 micron to above 200 microns. Magnified narrow size range data is also readily obtainable for detailed studies. **Coulter Electronics**

Gram-sensitive heavy-duty laboratory balances

For use wherever liquids or solids must be weighed with great accuracy, a new line of heavy-duty laboratory balances has been introduced. Sensitivity is 1 gram.

Available in capacities of 20 kilograms (45 lb) and 30 kilograms (70 lb), the new balances are known as Troemner Series 80 Solution Balances. Two stainless steel weigh



beams are graduated in grams and ounces (eight variant models), and a complete set of weights is included on an integral weight rack. Tare capacity is 2 kilograms.

Smooth, easy-to-clean, corrosion-resistant surfaces and ready portability are added features of the new Series 80 balances. Bulk-weighing scoop and small-animal box are optional accessories. All models measure 34" long, 11" wide, 10" high. **Henry Troemner, Inc.**

Perspiration resistant, transparent coating

A newly developed perspiration resistant, water clear transparent coating for application on brass, copper, and aluminum, has just been announced. It is also very resistant to marring, scuffing, bruising, scratching

and abrasion, and therefore recommended for lipstick cases and compacts which are called upon to endure handling and normal abuse.

This material is basically a highly specialized synthetic resin with an unusually fast curing ability. It may be applied by dipping or by spraying, either with conventional spray equipment or with electrostatic spray machines. Its long wearing, hard, durable, resistant finish is fast cured after baking for only two minutes at 400° F. **Chemical Coatings Division, Sun Chemical Corporation.**

Anti-dandruff additive

A new anti-dandruff additive is reported non-toxic and, when used in suggested amounts (0.5% to 3%), is completely non-irritant.

Known as Ks-182 (Dermosan), it will impart anti-dandruff characteristics to any type of shampoo without altering the shampoo's viscosity, color, perfume or other characteristics. It is soluble in cold and hot water and can be a powerful foam improver.

It is a viscous, thermoplastic, aminoproteinous material with a characteristic odor, clearly soluble in water. A 3% solution in water is practically odorless. **Kapral Research Laboratories, Inc.**

"Slim line look" in purse aerosols

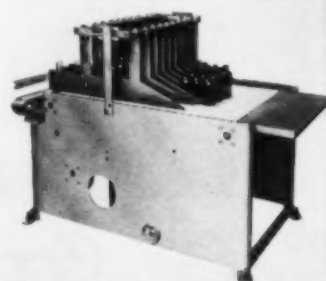
The "Slim Line Look" in aerosol purse perfumes has been introduced as a cooperative project of Bridgeport Metal Goods and VCA Incorporated. A patented refillable outer container by Bridgeport Metal Goods takes a stainless steel cartridge and 13mm. B18F 40mg. metered valve by VCA Incorporated. The dip tube, which has been incorporated into the molded plastic body construction of the valve, eliminates any possibility of it falling or sealing off. The double step construction of the 11cc inner cartridge allows room for the actuator to function. The lower section has been made with a larger diameter in order to obtain the 11cc volume without over elongation of the package. The three vertical lances on the outer edge of the actuator cap engage the beaded section of the body shell so that the cartridge and actuator will not fall

out of the case and also acts as a guide for easy refilling.

The outer aluminum and brass case will be offered in many designs and colors in accordance with desires of the customer. **Bridgeport Metal Goods or V.C.A. Incorporated.**

New automatic container feeder

An automatic feeder capable of handling all shapes and sizes of glass, plastic and metal containers at speeds up to 250 per minute, has been developed. The feeder automatically carries and places uncartoned containers on the conveyor at the start



of the packaging line. The unit has variable speed motor control and variable travel control permitting the feeder to handle as few as 40 containers per minute or as many as 250.

Designed to operate in conjunction with any existing production line, the new MRM feeder has its own right angle discharge conveyor which integrates with the intake conveyor for the next machine on the line. **MRM Company, Inc.**

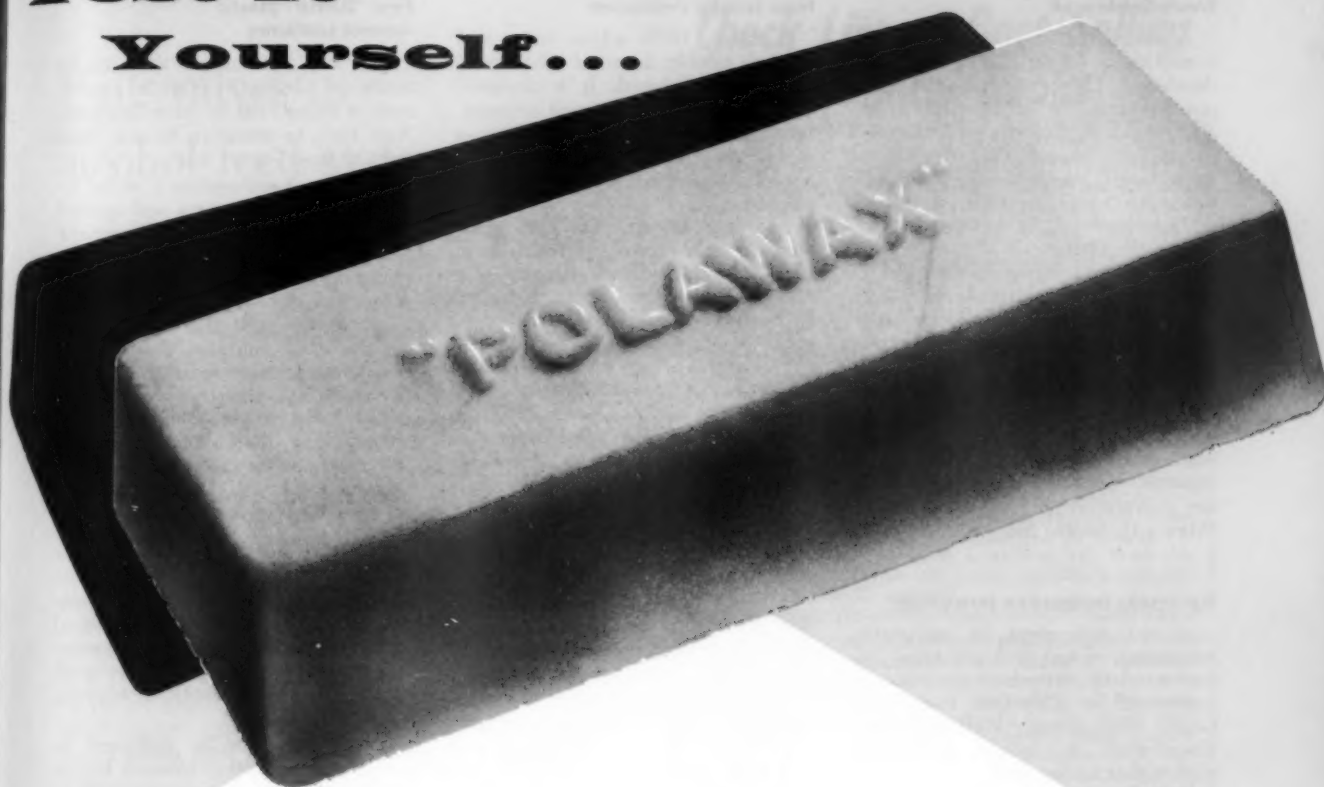
Protein Meter

Bausch & Lomb has developed a new Serum Protein Meter which provides accurate protein analyses in as little as one-tenth the time required by chemical methods.

Analyses for protein in serum can be run in only three quick steps: 1. Sample is centrifuged and serum placed in one of two sample cells. 2. Distilled water is put into second sample cell and placed on instrument, which is then "zeroed." 3. Sample cell containing serum is set on protein meter, which reads, directly, protein grams per 100mm. Only 2.5ml of serum are needed for accurate determination.

The eyepiece reticle contains two scales. One provides readings in serum protein directly to 0.1 gram (range: 0 to 12 grams per ml). The other, reading in refractive index difference, covers a range of 0.0234, and is extremely useful for making independent correlations between refractive index and other properties of solution. **Bausch & Lomb, Inc.**

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Recommended as a surfactant for quick-breaking aerosol foam preparations. Contributes to clear and colorless concentrates, soluble in alcohol, but not in water as required for this particular type of system.

- Recommended as primary emulsifier of o/w non-greasy vanishing creams.
- Recommended as a bodying agent and thickening agent for aqueous systems.

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Emulsifiable wax

A new, self-emulsifiable wax, with a melting point of 120°F, has been developed. The new product is composed essentially of myristyl, cetyl and stearyl alcohol esters of myristic, palmitic and stearic acids with chemically bound emulsifier. Stable emulsions are easily formed by simply adding warm water to the melted wax and agitating.

The wax will form permanent emulsions containing as much as 90 to 95% water—in neutral, acid or alkaline solutions. It forms a white, cream lotion with no odor or separation, even after standing for weeks. With 50% water, a creamy paste is formed, which may be diluted later. It is *not* water-soluble and 1% solutions separate. Contains no ethylene oxide, polyglycols nor added emulsifiers. **Werner G. Smith, Inc.**

Automatic integration instrument

A new instrument for automatic integration of test data presented by any standard servo-drive recorder, is announced by Ridgefield Instrument Group, Schlumberger Well Surveying Corporation. It replaces planimetry with higher accuracy.

Providing a permanent, easy-to-read analog record of test data, it can be used for quantitative analysis of gas chromatograms, flow and power totalizing, spectroscopic-spectrographic analysis, illumination testing, and a host of other applications. The Integrator-Recorder hookup reads out the integral signal on demand with an accuracy of 0.25% full scale. The integral is read back into the recorder itself when integration has been completed. **Ridgefield Instrument Group, Schlumberger Well Surveying Corp.**

Laboratory balance

A very high speed laboratory balance has been developed which combines a direct reading electro optical scale with an automatic weight placing system operated by two dials. The remarkably long optical scale of 10,200 mg (10.2 gr.) gives a performance capability of a speed at least three times as fast as other analytical balances in its class. The capacity of the balance is 200 gr. with a guaranteed accuracy of 1 mg. and a reproducibility of 0.5 mg. The dials, pan and read out scales are located in the same line of vision. This instrument, by Mikrowa, is Swiss made and will perform reliably under the most severe operating conditions. **C. H. Stoelting Company.**

New lanolin derivative

A stable, 100% active, water and alcohol soluble form of cholesterol has been developed. It is designed to provide a convenient and economical source of cholesterol for all types of topical preparations, including clear aqueous and alcoholic vehicles and emulsions.

It is the 24 mol ethylene oxide ether of cholesterol (derived from lanolin) and contains approximately 25% pure cholesterol. It has balanced hydrophilic and hydrophobic properties designed for optimum solubility without loss of the emollient and protective properties of cholesterol, and has the additional advantage of being an excellent solubilizer and emulsifier for o/w systems. **American Cholesterol Products, Inc.**

High speed combination packaging unit

A new type of packaging has been developed that will insert a small object and fill a precise amount of liquid into a leakproof flexible package. A high speed machine has been developed for this purpose, completing the package automatically.

It is felt that this development not only offers an inexpensive disposable package for providing an object immersed in liquid, but is ideally suited for sampling and/or market testing. First trials have been on a small sponge inserted in nail polish remover, suntan lotions, insect repellents and spot removers. **Packaging Services, Inc.**

Particle size analysis

A new instrumental technique for automatic particle size analysis has been reported. This unique nuclear-type analyzer is designed to overcome the many limitations of present day instrumentation and methods for the urgent problem of particle analysis. Intended for general use, both in industry and in the laboratory, this novel particle analyzer will be safe, non-destructive, and will be adaptable for continuous on-stream sampling, in dry or liquid state, without interfering or affecting the flow of production.

The theory of the automatic particle analyzer is based on a beta-ray, back scattering technique which measures the magnitude of fluctuations or the "spread" in a random sampling operation under specific geometrical conditions. Its source of radiation is Carbon 14. Its sensitivity range is from 1 to 500 microns and data is provided in a matter of minutes. **Evans Research and Development Corp.**

First "Delrin" plastic aerosol container

The first aerosol container to be made of duPont's "Delrin" acetal resin is being used by Avon Products, New York, to introduce its new "Buttons 'n' Bows" spray mist.

The new Avon container, styled by the company's designers and molded by Bernardin Bottle Cap Company, is teardrop in shape and two-toned in pink and rouge red. The upper half is fluted or ribbed, and the lower part is garlanded with three-dimensional ribbon bows. Injection molded, the two parts are decorated with script by hot stamping, then spin-welded together. Long an established bottle cap manufacturer, Bernardin expands its activities into the container field with the molding of this new aerosol. **E. I. du Pont de Nemours & Co.**

Methyl Isoamyl Ketone

Union Carbide Chemicals Company announces that methyl isoamyl ketone is now available in commercial quantities and is being produced at the Company's South Charleston, West Virginia, plant.

Priced at 17.5¢/lb. delivered in tank car lots, methyl isoamyl ketone represents the most economical, high-boiling solvent (145.4°C.) for vinyl and nitrocellulose lacquers.

Its higher dilution ratio as compared with the other high-boiling solvents being used in these applications also provides added savings in formulating costs. Methyl isoamyl ketone contributes lower viscosities, has a high relative evaporation rate, and offers excellent blush resistance. **Union Carbide Chemicals Company.**

Automatic pressure filler

Up to 40 16-ounce aerosol containers per minute can be filled with the new Filamatic Model DRB-16 volumetric type product filler announced recently by the National Instrument Company. It may be used for pressure or cold filling on new or existing aerosol lines. Installation is easily made by attaching a micro-switch actuator to the conveyor. The fill is automatically initiated each time the aerosol container depresses a microswitch. Accuracy of fill is better than 1%.

All liquid contacting parts are fabricated of type 18-8 stainless steel and Teflon. A 1/4 H.P. gearmotor and thyatron type electronic controller provide a 10 to 1 speed range. All moving parts rotate in self lubricated bearings, thus eliminating maintenance. **National Instrument Company.**

Plug valves in alcohol feed system cut costs and simplify piping

In its alcohol feed system, Eryan Perfumes have used plastic coated, lubricated plug valves to cut both the cost and complexity of the piping system. The new feed system was made necessary by the firm's new product, "Satinglide", which raised the volume of alcohol to several thousand gallons per month.

The plastic coated valves provide protection against metal corrosion contamination equal to stainless steel at a fraction of the cost. In addition, the three-way valves of this type take the place of two or three single valves, and save the maze of piping often found when flow must be available to alternate stations.



Plastic lubricated plug valves stop and start the flow of alcohol from storage tank to third-floor manufacturing area. These two Rockwell-Nordstrom three-way valves can be switched from plant-feed, to plant return, to off. The compact design eliminates maze of piping.

Check List of Best Selling Technical Books

COSMETICS, SCIENCE AND TECHNOLOGY. The editorial board of this encyclopedia cosmetic work is made up of H. D. Goulden, E. G. Klarmann, and Edward Sagarin, executive editor. It is in five parts: I, Scope of Cosmetics (80 pages); II, Toilet Preparations (812 pages containing 800 formulas); III, Manufacture and Technology (214 pages); IV, Physiological Considerations (92 pages); plus preface and complete index. The sixty-five experts who contributed, are a "who's who" of cosmetic chemists in the United States and Canada. 1433 pages. Illustrated. Price \$27.50.

HENLEY'S 20TH CENTURY BOOK OF FORMULAS, PROCESSES, TRADE SECRETS—REVISED, ENLARGED EDITION. Manufacturers, chemists and others call HENLEY'S the most valuable book of its kind. Nearly 10,000 formulas, processes, trade secrets. It contains formulas for nearly everything imaginable; new ways of doing things; technical process; so-called trade secrets. It has helped thousands make more from their present business and professions. A single formula may be worth more than 100 times the price of the book. Over 900 pages, completely indexed, cloth binding, \$5.25 postpaid.

INTERNATIONAL ENCYCLOPEDIA OF COSMETIC MATERIAL TRADE NAMES. By Maison G. deNavarre, brings you reference data you will turn to constantly . . . the most complete listing of all the materials of the world used in cosmetic manufacture . . . including quick concise descriptions of approximately 4,000 materials . . . the names and addresses of the suppliers . . . and a very useful cross-index of the materials and their uses. You will use it when seeking new materials, or substitutes for those you may now be using. 400 pages. Price \$7.50.

HANDBOOK OF COSMETIC MATERIALS. (Their Properties, Uses, and Toxic and Dermatologic Actions). By Leon Greenburg and David Lester. Contains alphabetical listing, with frequent cross references, of information on approximately 1,000 substances. For each compound gives: formula (including collateral names), properties, toxic action, dermatological action. Exhaustive bibliography. Essential for manufacturing chemists, cosmetic industry, dermatologists, allergists. 467 pages. Price \$13.50.

THE HANDBOOK OF SOLVENTS. By Leopold Scheffan and Morris Jacobs. The most useful work of its kind today. Part I covers theoretical aspects and practical attributes such as solvent action, solvent power, evaporation and evaporation rates. In Part II the physical constants of over 2700 liquid compounds are tabulated for easy comparison. 728 pages. Illustrated. Price \$10.25.

AMERICAN PERFUMER, Book Dept. 418 N. Austin Blvd., Oak Park, Illinois

- ☐ COSMETICS, SCIENCE AND TECHNOLOGY. — \$27.50
- ☐ HENLEY'S 20TH CENTURY BOOK OF FORMULAS. — \$5.25
- ☐ INTERNATIONAL ENCYCLOPEDIA OF COSMETIC MATERIAL TRADE NAMES. — \$7.50
- ☐ HANDBOOK OF COSMETIC MATERIALS. — \$13.50
- ☐ THE HANDBOOK OF SOLVENTS. — \$10.25

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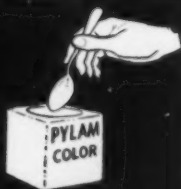
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Trade Literature

Surface Tensiometers

• A new 6-page bulletin from Fisher Scientific Company, 318 Fisher Building, Pittsburgh 19, Pa. describes two new instruments (one manual, one semi-automatic) for measuring surface tension and interfacial tension by the fast, accurate ring method. The instruments have many applications of oils, detergents, cosmetics, pharmaceuticals and emulsifiers. They are direct-reading instruments of the type devised by Lecomte du Nouy for studies of blood serum and are specified by ASTM methods D-971 and D-1331.

Volumetric filling machines

• "Popper & Sons, Inc. New York 10, New York announce a complete Catalog #860F, covering their expanded line of volumetric type filling machines.

This catalog consists of 12 pages of photographs, descriptions and technical data on a full range of machines, with particular emphasis on table models including several new developments.

These units should be of particular interest to pharmaceutical, cosmetic and food manufacturers."

Metallic stearates

• A ten page bulletin, by A. Boake, Roberts & Co., Stratford, London, E. 15, gives specifications and properties of calcium, lithium, magnesium and zinc stearates. A cosmetic formulary is given as well as five references to further material on this type of material.

How Silicones Work for the CPI

• This new manual, published by Dow Corning Corporation, Midland, Michigan, cites how various forms of silicones help design, process and maintenance engineers expand capacity, cut costs, lower maintenance, reduce downtime, increase reliability, and improve job conditions.

Included is information about many silicones—from antifoamers to foamers, from adhesives to adhesives, from paints to creams, from water repellants to dust filters. The advantages of silicone electrical insulating materials and systems in motors, transformers and generators are also briefly described.

Solids Processing Equipment

• A new bulletin on solids processing contains product description and specifications on the complete line of laboratory and production blenders, vacuum tumble dryers, a new Solids-Processor, and a general-purpose solids-flow valve manufactured by the Patterson-Kelley Co., Inc., East Stroudsburg, Pa.

The new 20-page bulletin also describes the organization and operation of the company's pre-test laboratory which tests customer formulations and helps to determine proper blending equipment and correct blending procedures.

Acetone

• A new, twelve-page technical booklet about Hercules Powder Company's acetone is now available from the company, Wilmington 99, Del.

Produced by Hercules' cumene oxidation process, the purity of the acetone is comparable to or exceeds that of acetone produced by other processes.

Information in the booklet includes data on Hercules' specifications and typical analysis; miscellaneous specifications; sales information; properties and chemistry; and a partial list of uses for acetone.

The section on chemistry includes a few of the specific and general types of reactions which Hercules' acetone is capable of undergoing.

PVP Formulary

• A new 22-page "PVP Formulary", a guide to new and improved products incorporating polyvinylpyrrolidone, has been issued by General Aniline & Film Corporation's Antara Chemicals Division, 435 Hudson St., New York, N. Y.

Formulations are given for more than 30 specific products in cosmetics and toiletries, pharmaceuticals and soaps and detergents. Aerosol, aqueous and organic-solvent systems are described. Considerable details are supplied for individual products, including required ingredients and suggested techniques of manufacture.

The booklet suggests new applications for both industrial and pharmaceutical grades of PVP, and it is arranged in such a way that it will serve as a convenient reference and guide.

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... NEWS AND EVENTS ... NEWS AND

Hoerner heads soap group

The Association of American Soap and Glycerine Producers, Inc. has elected John M. Hoerner president. Hoerner, who is vice president of Armour and Company and general manager of the Grocery Products Div., was elected during the group's 34th annual convention in New York City, recently.

Regional vice presidents chosen to serve with Hoerner are: M. C. Mumford, Lever Brothers Co.—*Eastern*; A. W. Schubert, Emery Industries, Inc.—*Middle-West*; and Retiring President A. K. Forthmann, Los Angeles Soap Co., *Western*.

Other officers are: N. S. Dahl, John T. Stanley Company, treasurer; M. A. McManus, Lever Brothers Company, assistant treasurer. Each was re-elected as was Roy W. Peet, association manager and secretary.

The new president has spent his entire 28-year business career closely allied to the soap and detergent industry. He joined Armour and Company in 1953 as director of sales for the chemical division. Hoerner's experience has ranged from basic research, technical service, industrial sales and production to marketing consumer products and management.

Flavor Chemists honor Hall

The Society of Flavor Chemists recently conferred an honorary membership on Dr. Richard L. Hall, director of research for McCormick & Co.

Meeting early this month, the group cited Dr. Hall for his "outstanding contributions to the science of flavor and, in particular, for his efforts as chairman of the Food Additives Committee of the Flavoring Extract Manufacturers Association."

Dr. Hall received his technical training at Harvard University, and in 1950 joined McCormick & Co. as research chemist. Currently, he not only heads up the research department but is also a member of the board of directors.

In addition to his work on the Food Additives Committee, Hall has served as chairman and member of the industry's scientific committee. At McCormick he has pioneered new flavor sources and methods of control that eventually will be of vast aid to the industry and the flavor-using public.

At the same meeting, Dr. William Stahl, research manager at McCormick & Co., spoke on "The Chemistry of Tea." He told of the known composition of flavoring oil in tea, and discussed the research conducted by his firm on relating the flavor quality of tea with instrumental methods control.

Perfumer group names new officers and directors

Bernard Polak, Polak's Frutal Works, Inc., and William H. Barlow, retired, have been named chairman of the board and president, respectively, of The American Society of Perfumers, Inc. for 1961.

Other officers are: John Hancock, Warner-Hudnut, first vice president; Harry Cuttler, Revlon, Inc., second vice president; Dorothy Douglass, Shulton, Inc., secretary; and Edwin D. Morgan, Jr., Lever Bros. Co., treasurer.

The directors include: Josephine Catapano, International Flavors & Fragrances, Inc.; August J. Schwindeman, Dodge & Olcott, Inc.; Dr. Steven Jellinek, Polak's Frutal Works, Inc.; and Edward J. Shuster, International Flavors & Fragrances, Inc.

Atlas and Stuart merger plans underway

Intent-to-merge papers have been signed by representatives of Atlas Powder Company and The Stuart Company, according to the companies' Presidents Ralph K. Gottshall and Arthur Hanisch, respectively.

The Stuart Co. produces and markets ethical drugs throughout the U. S. Atlas Powder makes industrial chemicals and explosives.

The merger involves a 4-for-1 split of the Atlas common stock. Stuart shareowners (except the principal ones) will be offered 1½ shares of the new Atlas common stock for each share of Stuart held. Stuart's principal shareowners will receive one share of new Atlas Class A stock for each five shares of Stuart.

The merger will enable Stuart's product development, manufacturing and marketing organizations to provide a significant outlet for the basic chemical research that Atlas has been conducting in fields closely related to ethical drug applications.

Business looks good for Christian Dior perfumes

At a recent sales meeting of Christian Dior Perfumes Corp., General Manager Paul Bremer reported a very satisfactory sales growth in 1960. Also he anticipates an "even greater rise in sales during the new year."

Bernard Picot, president of Parfume Christian Dior, Paris, attended the meeting. He was also guest of honor at a party given by the firm.

Old Empire acquires Garde Drug

Old Empire has acquired the facilities of Garde Drug Co., Inc. of Philadelphia, Penna.

This acquisition will enable Old Empire to offer expanded service and facilities for the packaging of pharmaceuticals in powders, tablet and liquid forms in Philadelphia as well as in Newark.

New closure and fitment facilities announced

Completely diversified facilities, including both thermosetting and thermoplastic manufacturing resources, fully concentrated in one organization, are provided by Roth-Pak, Inc., a newly formed manufacturing and marketing company specializing in the plastic closure and fitment field.

The new company is headed by Robert A. Roth. Says Mr. Roth:

"While we know packaging broadly, we are specialists in closures and fittings because we believe that the ever-growing and increasingly intricate need for fittings and closures by the industry demands such specialization."

French cosmetologists honor Albo and Marcy



Rene Albo



Rene Marcy

The French Societe of Cosmetology has given its 1960-61 awards to Rene Albo, chemical engineer; and to Rene Marcy, Doctor of Pharmacy and teacher at the Ecole Nationale de Medecine et Pharmacie de Caen.

Albo was awarded the Gattefosse Medal for his important works in the field of technical cosmetology. Marcy won the same award for his thorough research on cicatrization phenomena.

The awards were given during the society's eleventh general assembly in Paris, recently.

Nolen new chief executive officer of McKesson & Robbins

President Herman C. Nolen, McKesson & Robbins, Inc., New York City, has been named chief executive officer of the firm. He succeeds George Van Gorder, who continues as chairman of the board.

Pearl named to southern sales; List, to East for Holmes

New sales representatives have just been named by T. J. Holmes Co., Inc., Chartley, Mass. Joseph Pearl will handle sales of Holmspray cologne and perfume atomizers in southern Florida, and Edward J. List will cover Penna., Va., W. Va., Dela., Md., and the District of Columbia.

deNavarre is luncheon speaker at Chicago perfume meeting

Maison G. de Navarre, vice president Cosmetic Laboratories, Inc., Detroit, and editorial director of AMERICAN PERFUMER magazine warned of the increasing difficulties of introducing new cosmetics today.

Speaking at recent luncheon meeting of the Chicago Perfumery, Soap and Extract Assoc., deNavarre em-

phasized the difficulty being brought about by a pre-testing requirement. He also told of considerable changes that will come about within the industry due to the growth of dermatological pharmaceuticals.

Maisondieu joins Charabot

Jacques Maisondieu has recently joined the House of Charabot & Cie. in Grasse, France, according to President M. G. Couderchet.

West is new assistant director of R-H biological laboratories

Dr. Bob West is newly appointed assistant director of biological laboratories for Rosner-Hixson Laboratories, Chicago, according to Director Dr. Lawrence Rosner.

Prior to joining the consulting firm, West was a research associate at Jefferson Medical College and a research pharmacologist with American Cyanamid.

New post for Thorkilsen at Colgate-Palmolive

Harold N. Thorkilsen has been named to newly-created position of manager-research coordination for the Colgate-Palmolive Company's Toilet Articles div. He was formerly district manager of the Denver area.

Research director named by Felton Chemical

Felton Chemical Co., Inc., Brooklyn, N. Y., has appointed Victor M. Levey research director. He will be responsible for both the analytical and research laboratories.

New vice president at Aerosol Techniques

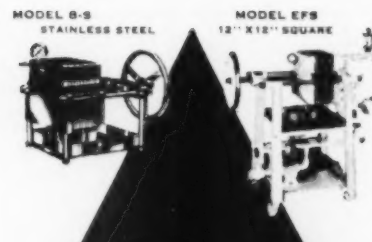
David Benjamin is a new vice president of Aerosol Techniques, Inc., Bridgeport, Conn. The former assistant to the president will be in charge of planning and engineering for the company.

Buurman named new production manager General Dyestuff

Dr. Clarence H. Buurman is new production manager at Linden (N. J.) plant of General Dyestuff Co., div. of General Aniline & Film Corp. He will report directly to Dr. John C. Lawler recently named director of manufacturing. Buurman will be responsible for all operations of the vat color department.


New lactic acid available in pilot-size lots

Currently being offered in pilot-size lots is a new lactic acid solution




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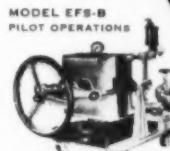
MODEL 8-S
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MODEL EFS
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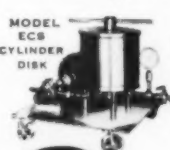
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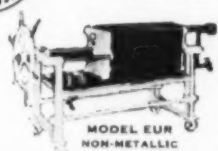
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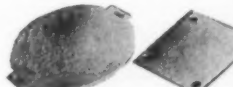
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in which the dextrorotatory isomer predominates.

The solution may possibly have application in ointments and creams for topical application in the relief of psoriasis.

The product contains not less than 82% of the dextrorotatory isomer. Heretofore, commercial quantities of lactic acid have been the optically inactive racemic mixture of isomers. Miles Chemical Company.

Old Empire expands facilities

Old Empire, Inc., has just acquired an additional 30,000 square foot building directly adjoining their present buildings.

Old Empire, private brand packager and manufacturer of aerosol perfumes, drug, toiletries and cosmetics, will use the new building for expanded manufacturing as well as additional warehousing facilities.

Mint oil price to remain strong, economist tells growers

Marion Thomas, Oregon State College extension agricultural economist says, "price of mint oil looks encouraging for the next couple of years. But," he warns, "a high price . . . which stimulates production . . . is the way price problems are born."

Speaking before some 130 mint growers, fieldmen, and industry representatives convened for the 12th Annual meeting of the Oregon Essential Oil Growers League, Thomas cautioned the growers not to plan future plantings too optimistically. "Prices, he said, probably will turn downward in 1963 and 1964.

Within the next year or two he expects U. S. mint oil production to pass the 1958 peak of 2½ million pounds. This is predicated on current efforts to solve mint wilt and other industry problems being successful.

Currently, research is underway to find a mint variety that is resistant to wilt, according to Dr. C. A. Thomas, head plant pathologist of the U.S. D.A.'s industrial crops section, Beltsville, Md., another speaker at the two-day conference.

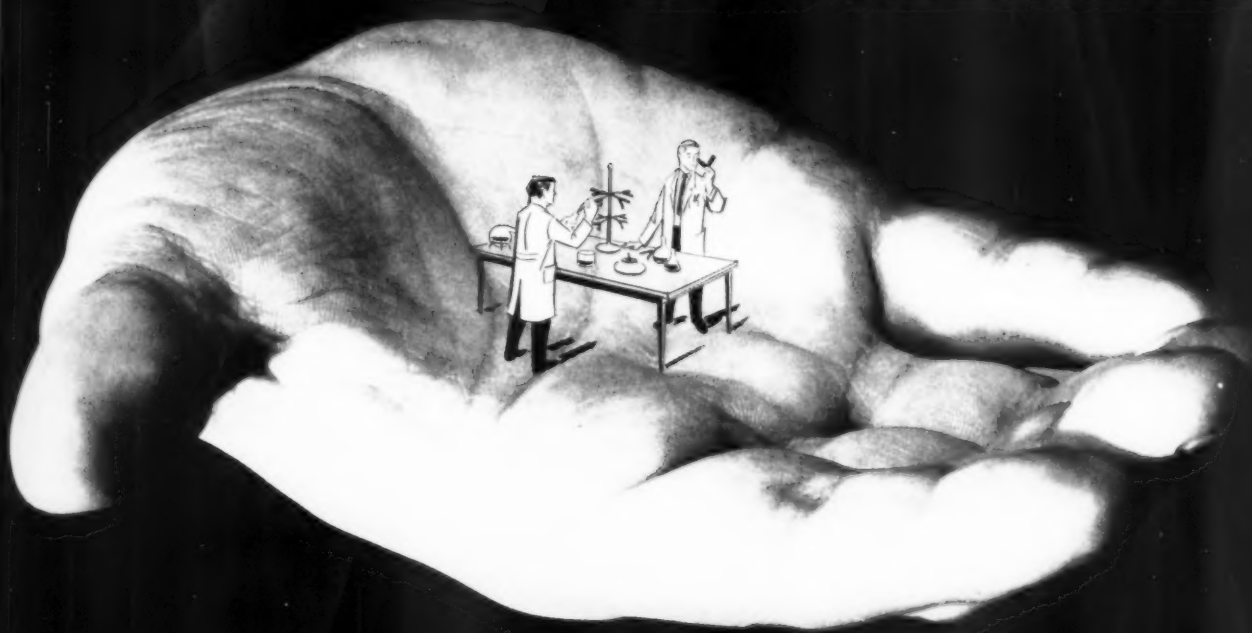
According to retiring president Dale Eisenmann, research on mint problems has been given a boost by a \$16,500 grant from Colgate-Palmolive Co., Procter and Gamble, William Wrigley, Jr., Beech-Nut Lifesavers, and American Chicle Co.

At the meeting, the group elected Ed Ammon president for the ensuing year. Arthur R. Yungen is new vice president and Iain C. MacSwan, Oregon State College extension plant pathologist, and James Gossler were re-elected secretary and treasurer, respectively.

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News of the Societies of Cosmetic Chemists

New York chapter

Acetylated lanolin derivatives per se, and incorporated into typical soap emulsions, show great resistance to hydrolysis. With these words Lester Conrad, Technical Director of American Cholesterol Products, Inc. introduced the results of a three-year study to the N. Y. Chapter of the S.C.C.

These acetylated products demonstrate the stability characteristic of waxes, and indeed the acetylated lanolin, lanolin alcohols and ricinoleate of lanolin alcohols contain no glycerides.

The stability was determined by extracting the water soluble acid formed through hydrolysis and comparing it to that theoretically available. A maximum of 0.4% hydrolyzable material was formed after 36 months. Free fatty acid was also determined and showed an increase of only 0.25%. Lanolin itself shows an increase of 3.0%.

In a typical soap emulsion containing 4% of the acetylated lanolin derivatives, the change in pH was used as a measure of hydrolysis. A formulation with 4% acetylated monoglyceride was included for comparison. Room temperature and elevated temperature aging showed minor pH changes for the acetylated lanolin derivatives, and a drop of 2.5 pH units for acetylated monoglycerides.

The paper was presented at the Annual President's Night of the N.Y. Chapter of the S.C.C. National President H. J. Amsterdam installed the new officers for 1961—Saul Bell, Chairman; Martin Katz, Chairman-Elect; Agnes Korte, Secretary, and Robert J. Schiraldi, Treasurer.

Chicago chapter

At a recent meeting of the Chicago Chapter of the Society of Cosmetic Chemists, the following officers were elected for 1961.

William H. Walker, Fuller Products Co., Chairman; Stillman R. Goff, The Toni Co., Chairman-Elect; Lura S. Ricketts, The Toni Co., Secretary; William D. Ackley, International Flavors & Fragrance, Inc., Treasurer.

Mr. Walker has since appointed his Board of Directors and Chairmen of various committees. Education, Adam T. Krol, Clearing Chemical Laboratories, Inc.; Publicity, Beverly J. Steinberg, The Toni Co.; House, Louis Lerner, The Toni Co.; Program, Warren Hintz, Alberto Culver Co.; Hospitality, Chester F. Maculeski, Clintwood Chemical Co.; Inter-Prof. Relations, Dr. Emery Robert, Fuller Products Co.; Membership, Marshall Sorkin, Helene Curtis Co.; Policy and By-laws, Fred Timmons, Kolar Laboratories; Ladies' Night, Barton R. Owells, Chemical Enterprises.

Mr. Fred Klepetar, Senior Research Chemist of Johns-Manville Corp., Dutch Brand Division was the feature speaker at the meeting and presented a very interesting talk on the subject of relationships between the chemist and management and what the role of the chemist should be in the various capacities. He also discussed the American Chemical Society Employment Bureau in some detail.

SCC of Great Britain

At the recent meeting of the society, Professor C. S. Whewell, Leeds University described experimental work done on wool. The general principles, he noted, are applicable also to hair, but quantitative aspects are specific to each fiber.

Dr. Whewell summarized the structure of human hair and compared it to wool. Hair is composed of cuticle, cortex and, sometimes, medulla. The corticle cells may be divided into fibrils and micro-fibrils. In wool, on the other hand, there are two types of cells, ortho-cortex and para-cortex. In crimped fiber, the former is on the outside and the latter on the inside of the crimp. The ortho-cortex is the most reactive, Dr. Whewell stated. His findings reveal the crystalline/amorphous ratio in hair to be 20/80.

In hair, he continued, many fibers are pigmented but the distribution of the pigment is not always uniform. The distribution of cells producing pigment is asymmetrical even in the follicle. He noted the presence of pigment affects the physical properties of the fibers, and is probably due to cross linkages.

Dr. Whewell's work indicates that pigment granules from the hair can be isolated by boiling the hair with phenol and thio-glycolic acid.

In studying the elastic characteristics of pigmented and un-pigmented hair, the standard chosen was the force required to stretch hair by 30% of its initial length. For black hair this was 1.49 units and for white, 1.34. Thus black hair is stronger than white, Dr. Whewell reports.

Black fibers can be bleached by hydrogen peroxide and an iron catalyst, but Dr. Whewell found the process difficult to control. Pigmented hair absorbs more iron than unpigmented. Also less degradation of hair occurs if the hair is thoroughly washed between the iron treatment and the bleaching. He noted there is always danger of degradation following extended bleaching, and found formaldehyde in the iron treatment to be useful.

Dr. Whewell stressed the relation between the reactivity of wool and its ability to take a permanent set. He reported if hair is stretched 40%, boiled in water for the necessary time, slacked off, and again boiled in water any set that has been produced will be longer than originally. When the set is plotted against setting time the curve shows an initial period of super contraction prior to setting. He suggested the first stage is caused by bond breaking; the second stage of setting, from bond rebuilding and stabilizing.

Dr. Whewell told of the effect of oxidizing agents on setting. He reported, recently, tetra bis (hydroxy methyl) phosphonium chloride and thio urea dioxide have been shown to be effective setting agents. And suggested the reducing properties of the chemicals as the reason.

In addition Dr. Whewell told of the research on supercontraction and of the interest in absorption of cuprammonium hydroxide on hair. Hair treated this way, he said, gave no X-ray photograph. This suggests a change in hair structure.



PERSONALITIES

Frank W. Berryman, Jr., has been named sales manager for Eagle Chemical Company, Mobile, Alabama. Mr. Berryman was previously with the Linde Company, a division of Union Carbide Corporation.

Benjamin Green has joined the New York sales staff of W. Braum Co., Inc. in the plastic and glass container and closure division. Mr. Green consultant on special assignments for several leading cosmetic companies, and has been associated with the cosmetic and drug fields for over twenty years.

Francis Charles has been appointed director of manufacturing of the Antara Chemicals division, General Aniline & Film Corporation. **James M. Cloney** has been named director of marketing. **Dr. Frederick J. Gajewski** has been appointed technical director and **Wallace G. Clarke** will become special assistant to the general manager, **Dr. C. C. Schulze**.

Ray H. Mulford has been elected an executive vice president of Owens-Illinois Glass Company. Mr. Mulford will continue as president of the company's glass container division. He joined Owens-Illinois in 1933 and has been a vice president since 1949.

Richard P. Pearson has been named assistant sales manager of the Aerosol Division for the Risdon Manufacturing Company. From 1959 until the present, Mr. Pearson was assistant sales manager of the Wire Goods Division.

D. J. Olsen has been appointed general manager of manufacturing for Lehn & Fink Products Corporation. Formerly manager of production control, Mr. Olsen will assist in the overall direction of the division and will be responsible for the liaison of the manufacturing division with the marketing divisions.

Harry B. Paul, formerly manager of Atlas Powder's Wilmington region of the chemical sales department, has been transferred to the International Division for future assignment as manager of European operations. **Joseph J. Byrne**, formerly assistant to the field sales manager, succeeds Mr. Paul and **E. Joseph Costello** will replace Mr. Byrne.

A. S. Bedell, treasurer of Beauty Counselors, Inc., for 29 years, retired the first of this year. He remains on the company's board of directors.

New research and development consultant at Rhodia, Inc., New York City, is **Philip Chaleyer**, internationally known perfumer and expert in aromatic products. His work for Rhodia will center around the development of new perfume chemicals and basic fragrances for use in the cosmetic, soap and perfume industries.

In addition to this work Chaleyer will continue as consultant for Hoffman LaRoche Inc.

Donald R. McLennan has been named manager of chain store sales for Yardley of London, Inc. Mr. McLennan was formerly national drug sales manager of Landers, Frary and Clark.

Leon Givaudan has returned to Switzerland to join the executive management of L. Givaudan & Cie., S.A. During the past eight years, he has been in charge of the development of Cia. Brasileira Givaudan and continues to remain active in its management.

Andrew D. Davey has joined the sales organization of Fritzsche Brothers, Inc., and has been assigned to represent the New York essential oil and aromatic chemical firm as manager of the Boston office.

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Carl K. Raiser, Smith Kline & French, and Herbert C. Rorer, Wm. H. Rorer, Inc., were elected president and vice president, respectively, of the century-old Philadelphia Drug Exchange, the oldest drug trade association in the United States.

Frank Pergolizzi has joined The Mennen Company as senior research chemist in the research and development department. Mr. Pergolizzi was previously with Bristol Meyers as an industrial chemist.

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Rocco L. Russo will fill the position of technical service manager at Hodag Chemical Corporation and Harry B. Parker will serve as technical representative for the company. Russo was formerly with Smith-Douglas Fertilizer Co., Inc. and Parker was with KVP-Sutherland Co.

Joseph J. Winer has been named to fill the newly-created post of assistant-to-the-president, and assistant treasurer, at Puritan Aerosol Corporation, Boston. Mr. Winer's previous position as comptroller will be filled by Richard H. Daley.

Henry Mahnken has been appointed chief control chemist for the Onyx Chemical Corporation and Leonard Hodes has been named assistant director of technical service for the corporation. Conrad Hohing has been named manager of the Staten Island plant number 2 for Onyx.

Michael J. Gluck has been appointed vice president and general manager of Heyden Newport International division. Mr. Gluck has been director of overseas operations for the Corporation's Nuodex Products division since 1956. Other executive changes at Heyden Newport divisions include the naming of Knox Price as general manager of Nuodex Products of California, Earl P. Hanson as district manager of the Heyden Chemical division and Lawrence Samler as plant manager of Nuodex Products of California.

Edward Greening has been appointed director of manufacturing at the Collway Pigments division of General Aniline & Film Corporation. Robert C. Hyatt has been named director of marketing and Dr. Leon Katz, formerly product manager-pigments, will become the division's technical director.

Norman L. Case has been appointed manager, market research for the Jefferson Chemical Company, Inc. Before joining Jefferson Mr. Case was with Monsanto Chemical Company. Other company appointments include Robert H. Darling as plant manager of Jefferson's Port Neches, Texas plant and R. V. Boyce as district sales manager in charge of the company's newly created west coast district.

Frederick A. Menkes has been appointed superintendent of the Elizabeth, New Jersey works of Allied Chemical's General Chemical Division. Mr. Menkes has been with the division for 14 years and was previously maintenance superintendent of the Metropolis, Illinois works.

Roger M. Kirk, Jr., has been named manager of the Lehn & Fink Division. In this capacity, Kirk will be responsible for the direction of the division's overall administration, including sales, merchandising, advertising and promotion.

Obituary

Louis J. Woolf, 70, chairman of the board of H. Kohnstamm & Co., Inc. in New York City.

He joined the firm 47 years ago and a short time thereafter was appointed sales representative in the color and flavor divisions. He became president of the company in 1950 and chairman of the board in 1957.

Mr. Woolf was very active in many trade associations, such as the Flavoring Extract Manufacturers Association and the Fruit and Syrup Manufacturers Association.

He is survived by his widow, two daughters, eight grandchildren, a niece, and a nephew—Robert S. Woolf—also associated with the company.



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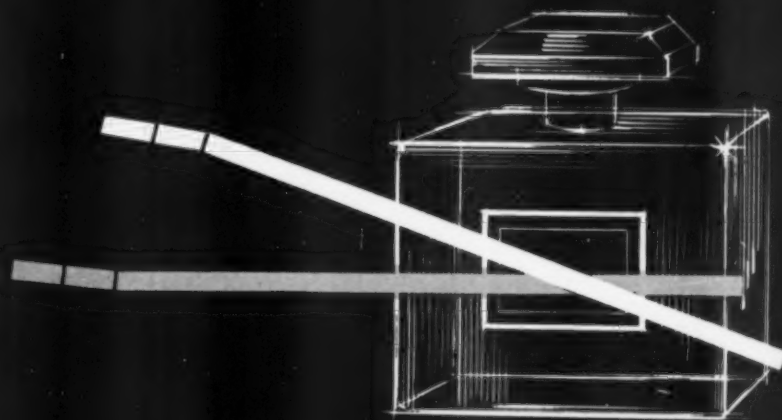
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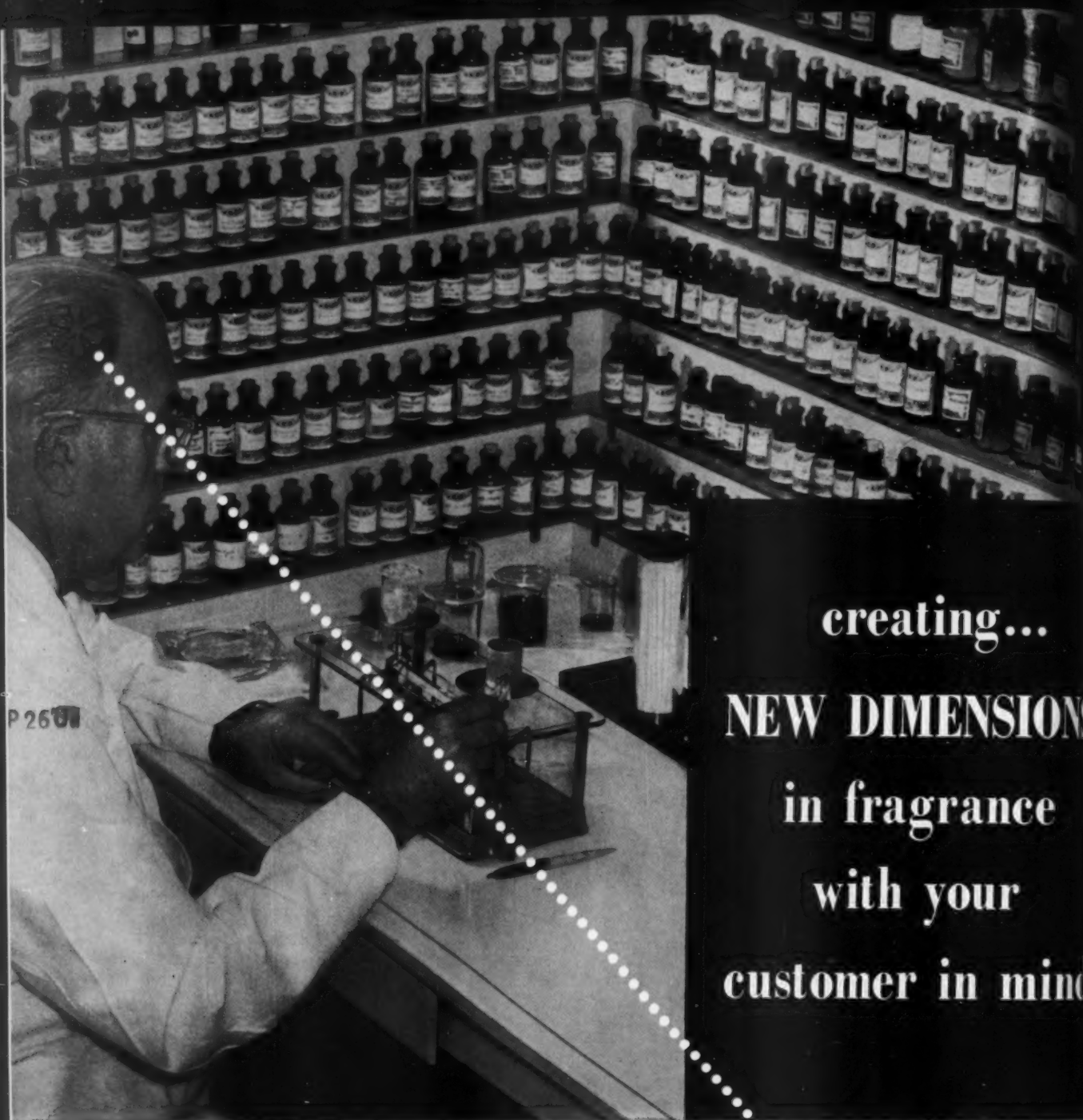
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